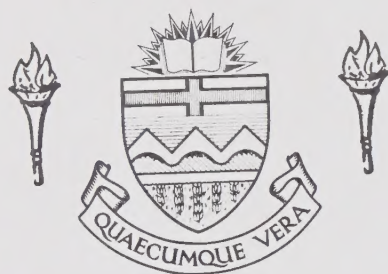



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THE UNIVERSITY OF ALBERTA

THE NEED FOR A CLARIFICATION TREATMENT OF
PICTURES USED AS CONVEYERS OF MEANING
IN SECOND LANGUAGE LEARNING

BY



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A THESIS

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The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies for acceptance, a thesis entitled "The Need for a Clarification Treatment of Pictures used as Conveyers of Meaning in Second Language Learning" submitted by Roger H. Clements in partial fulfilment of the requirements for the degree of Master of Education.

ABSTRACT

In order to examine the meaning-conveying capacity of visuals in foreign language instruction, pictures in sequence were chosen for observation from Voix et Images de France. These pictures were classified as either simple or compound and were presented for interpretation under two principal experimental conditions to a sample of eight classes of grade six pupils attending public schools in Edmonton. The interpretations were analyzed according to direction, modality, content, and total message in order to ascertain the degree of correspondence to the same dimensions of the program author's intended message.

To test the major hypotheses that simple pictures were not more difficult to interpret than compound ones, and that the one kind of treatment did not yield more accurate responses than the other, a two-way analysis of variance with repeated measures on one factor and equal cell numbers was used. The levels of the "A" factor were the simple and compound pictures, the repeated measures were the pictures, and the two levels of the "B" factor were the treatment conditions. An examination of any influence that the added time for observation may have had under one of the treatment conditions was carried out. The effect of order of presentation of the visuals was also studied. An F ratio to test the significance between the means was used for each of the hypotheses. The

intercorrelations of the dimensions for the four major phases of the study were calculated, and in addition, a multiple regression analysis was performed to determine the degree to which the total message conveyed by the pictures was dependent upon its composite parts.

The results indicated that the treatment conditions under which the pictures were observed significantly influenced performance on all dimensions except direction, which, on the other hand, was the only dimension significantly affected by the kind of picture under observation. The extra time necessary for the clarification treatment did not influence interpretive performance. The order of presentation of the pictorial sequences was found, in some instances, to influence performance. Evidence suggested that this influence was the result of chance allocation when the school classes were randomly assigned to the different experimental treatment conditions. The best predictor of the total message for both kinds of pictures under either of the study conditions was content, but modality, too, was shown to have useful predictive power for simple pictures.

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CHAPTER I

THE NATURE OF THE PROBLEM

I. INTRODUCTION

The most widely employed means of communication in any community is usually the spoken language. It is efficient in conveying meaning because it is a code understood by the members of that community. The two principal features which permit a coded message to be understood are the formal structure patterns of the separate elements of the message, and the context in which this established pattern is placed. Despite the systematization of the code, some confusion may arise when semantic elements are found in ambiguous contexts. The utterance, / ðæts ə bæd breyk / That's a bad break,¹ could cause confusion if the hearer, because of a misunderstood context, chooses a wrong meaning from the number of possible ones. Given an appropriate context the utterance could mean, "The bone is severely fractured", "The cup is smashed", or "You are very unlucky". Possibilities for misinterpretation, though comparatively rare, are natural even to an established and familiar code like language. Without the appropriate situational contextualization, the sender's intended message cannot be

¹H. A. Gleason, Jr., An Introduction to Descriptive Linguistics (New York: Holt, Rinehart and Winston, 1961), pp. 14-39. (This source provided the system of phonemic transcriptions.)

perfectly understood by the receiver.

Over the years foreign language teachers have resorted to different ways of communicating the intended meaning of the target language structures. At one end of a teaching methods continuum, users of the "traditional" grammar translation method have relied on translating the structures into the mother tongue. Those instructors who pay full allegiance to the "direct" method may conveniently be placed at the other end of the same continuum. They have banned translation and set about to convey meaning by the use of realia and the second language structures already taught. These opposite ways of conveying meaning correspond to the different aims pursued. In all fairness to the many linguistically orientated programs at present available to teachers, it must be said that each of them has its own place on the continuum. Generally speaking, the major emphasis is on the use of the target language but the expedient of translation or paraphrasing may be retained to promote understanding.

The traditional method endeavoured to prepare students to read and write rather than to express themselves orally for immediate communication. It tended to prepare what Nelson Brooks calls "compound bilinguals"² -- those who acquire the second language by constant comparison with the

²Nelson Brooks, Language and Language Learning (New York: Harcourt, Brace, and World, 1960), p. 267.

first one. The "direct" method, which stresses oral expression, proposes to prepare people to use the target language as an independent code without constant reference to the mother tongue. Students prepared by this method would be considered as "coordinate bilinguals".³ Contemporary programs like Voix et Images de France,⁴ Méthode de l'Alliance Française,⁵ La France en Direct⁶ avoid translation or paraphrasing as a teaching device. Others like Ecouter et Parler⁷ and Audio-Lingual Materials⁸ use it discreetly, withdrawing this crutch as the student progresses in the second language.

In an attempt to improve the understanding of the target language, Voix et Images de France uses filmstrips which illustrate situations. Each situation represents the context in which the verbal structures would be used. According to the underlying theory of this program, once

³Ibid.

⁴Voix et Images de France. Centre de Recherche et d'études pour la diffusion du français, Ecole normale supérieure de Saint-Cloud (Paris: Didier, 1962).

⁵Méthode de l'Alliance Française (Paris: Hachette, 1965).

⁶La France en Direct (Paris: Hachette, 1969).

⁷Dominique G. Côté, Sylvia Harens Levy, and Patricia O'Connor, Ecouter et Parler (New York: Holt, Winston and Rinehart, 1968).

⁸Audio-Lingual Materials (A-LM), Teacher's manual, French Level One. A teaching handbook prepared by the staff of the Modern Language Materials Development Center (New York: Harcourt, Brace and World, 1961).

the link has been established between the situation in the picture and the utterance, the latter is acquired in its own right and there is no further need for a pictorial representation. Unless some situational context accompanies the linguistic pattern in the early stages of second language learning, it would seem that the steps leading to the coordinate acquisition of the second language are not being taken.

This study is centered on the use of an audio-visual program which never resorts to translation, and which aims at conveying meaning through taped dialogues in the target language accompanied by filmstrips illustrating the situations in which the heard language could be used. Before stating the aim, it should be said that meaning is defined here as the "signifié" of a "signifiant".⁹ The "signifiant" is either the oral manifestation of a message or its pictorial representation. The closer the relationship between the intended meaning of the sent message and the meaning of the received message, the better the intended "signifié" is understood.

The aim of the present study is to investigate the meaning-conveying capacity of certain chosen pictures which have been classified as either simple or compound. The

⁹Ferdinand de Saussure, Course in General Linguistics, C. Bally and A. Sechehaye (ed.), Wade Baskin (trans.), (New York: The Philosophical Library, 1959), p. 67.

classification is defined in terms of the type of pictorial composition. The student is asked to interpret one picture at a time after observing it without hearing the taped dialogue which normally accompanies it. In one phase of the study, he observes the picture and writes down the message he thinks best suits the situation; in the other, the meaningful pictorial elements, i.e. those relating directly to the oral message, are pointed out, and then he makes his interpretation. The procedure of focusing the students' attention on the pictorial elements is called the clarification treatment throughout the study. The interpretation of each picture is analyzed and the scores yielded by this analysis are the raw data which are processed to determine the relationships between the kinds of pictures under examination and the type of treatment to which they are submitted.

II. BACKGROUND TO THE PROBLEM

De Saussure has identified the elements which make up the system of communication called language.¹⁰ He speaks about the sign as the interrelation between the "signifié" or meaning, and the "signifiant" or sound pattern conveying the meaning. Every sign expresses a global total message and has an analytical aspect which takes into account the individual and relative value of every component of the

¹⁰ Ibid., pp. 7-23.

sound pattern. The chain of sounds in the English sentence, "My brother likes animals", can serve to illustrate the two essential features of the sign. The structure in its entirety conveys the whole idea of a man having the same parents as I do enjoying a certain pre-disposition towards certain creatures. This total meaning is dependent on the semantic quality of each word, the relative place of each word in the set pattern, the relative place of this set pattern in other patterns, and a number of paralinguistic features. The semantic quality is a function of the way the separate phonemes are combined into meaningful units.

The sound pattern may be long and involved or short and simple, but whatever its nature it can be analyzed into a number of components. A paragraph may be broken into organized systems of sentences which are systems of words. These, in turn, can be regarded as systems of morphemes which may finally be broken down into systems of phonemes.

At the most basic level, the total meaning of a structure may be changed by altering its semantic content by the substitution of a single phoneme. This may be demonstrated when /f/ is substituted for /h/ in the transition from /pliɪz hoʊld ðɪs/ Please hold this to /pliɪz foʊld ðɪs/ Please fold this. The semantic change caused by adding the pattern of phonemes, i.e. the morpheme /ɪm/ im to a word in the sentence / ðæt s not posɪbl/ That's

not possible so that it becomes / ðæt s not imposibl/
That's not impossible, also causes a change in total meaning.
 The replacement of words also causes semantic changes which
 affect total meaning. This can be shown when the word
 /hæpiy/ happy in /ʃiy iz hæpiy/ She is happy is replaced by
 /soriy/ sorry so that the sentence becomes /ʃiy iz soriy/
She is sorry. The three instances cited above have shown
 that changes in the global meaning have been caused by
 different modifications at the semantic level. It is
 possible to hold the semantic elements constant and effect a
 variation in the whole meaning by varying the syntactic
 patterns of the words. This point may be illustrated by
 changing the word order of /səsayHtiy distrusts ðə tiynej̆ər/
Society distrusts the teenager to /ðə tiynej̆ər distrusts
 səsayHtiy/ The teenager distrusts society.

This sort of analysis is descriptive of language
 because the linguistic elements are interrelated by
 conventions, and its pertinence to the present study
 becomes immediately obvious. If a picture is to convey the
 same message to all people, there has to be a generally
 accepted system of pictorial signs constituting a visual
 code. Before investigating the possibility of the existence
 of such a code, the relevance of Prieto's analysis of some
 of the simplest visual codes should be examined.¹¹

¹¹Luis J. Prieto, Messages et Signaux (Paris:
 Presses Universitaires de France, 1966).

Prieto has adapted some of the principles of de Saussure's analysis of language to describe the composition of some of the simple systems of communication which use visuals. He has explained the international code of highway signs in terms of "signifiants" and "signifiés". This code has a regulatory function and certainly ranks as one of the least complex. It must communicate by visual means messages characterized by their brevity under conditions which demand that they be seen and understood accurately and spontaneously. The colour, shape, and content of highway signs have value in conveying meaning, and their different possible combinations modify meanings. A white rectangle with the black graphic symbol 60 in the middle may mean: "Do not exceed 60 miles an hour", but the same sign with a yellow background tells the driver that he may exceed that speed but caution should be taken -- perhaps because of road conditions. Taken from the context of the total sign, the separate components of colour, shape, and symbol are meaningless in themselves, but as part of the road code, they operate at a level equivalent to that of the phoneme in the language code. The rectangular shape suggests a regulation about speed, the background colour indicates some modification, and the number adds a specific numerical value. When the two "phonemic" elements of rectangular shape and yellow background are added, it could be said that the equivalent of the morphemic level of a speech pattern has been reached, and this visual

"morpheme" signifies a regulation about speed with a certain permissive factor. When the third element "60" is added, the "syntactic" pattern of the sign could be said to be completed and the full significance of the combination of elements becomes apparent. The numerical value is associated with the permissive element and they are related to speed on the highway; thus, the driver receives the intended message: "You may drive above '60' but be especially careful."

In the event that any of the "phonemic" elements of this sign are changed, either the total meaning will change or it will become meaningless. If the background is painted red instead of yellow and such a red background is not one of the accepted features associated with a rectangular shape, the sign will cause confusion for the motorist. It may well be that in the same code, the colour red itself has a purpose only when associated with a circular shape. Here, two accepted elements have been combined to make an alien combination, and perplexity results. This is the same situation that could occur if a traveller acquainted with only the highway code of his own culture drove on foreign roads. If the sign he saw corresponded to one of his own country's, he would infer they had the same meaning, although it is possible the meanings could differ from culture to culture. If it were a standard sign in the foreign country but different from any of his own,

again it would be useless to him as a means of conveying its intended message.

The parallel between the analysis of the sound chain of language and the visual system of communicating highway messages seems to be justified. The transition must be made now to a more complex means of conveying meaning: to the kind of pictures providing the situational contextualization in foreign language programs. Monod,¹² whose study involved educational films including stills, has taken another step towards determining the degree of systematization that may exist in communication involving visual aids. He has analyzed and categorized the iconic elements that combine to make a picture.¹³ His analysis includes pictorial elements called "informations" which are direct representations drawn from reality. They convey their message directly on sight. Others are "indices" which are the effect from which the observer deduces the cause, and "signes" which can themselves be categorized into "vestèmes", "objectèmes", "gestèmes", and "ideographèmes". An example of a sign that belongs to the "vestème" code would be a soldier's uniform displaying the rank of corporal. The uniform distinguishes the wearer as a male, as a member of a

¹²Pierre A. E. Monod, "La Langue et le Geste" (unpublished doctoral thesis, The University of Strasbourg, France, 1969).

¹³Ibid., p. 38.

branch of the armed services, and as a soldier of a particular rank. It belongs to an accepted code in society and acts as a sign to be interpreted by members of the community. However, on transposing the uniformed figure to a picture, it cannot be said that it is a part of a pictorial code which aids the correct interpretation of pictures. The uniformed figure would in all likelihood serve only as a part of the context for the message being conveyed by the picture. To grasp the full significance of the intended message, it may be necessary to know that one of the participants in the situation is a soldier but the actual topic and comment of the conveyed message may make no reference to him. Because the sign of a soldier's dress of a common rank is so firmly established in real life, its meaning is unequivocal in the pictorial representation and does not have to be interpreted. It is understood immediately and functions as an "information". The question that must be resolved in an investigation of the existence of a pictorial code is: "Are pictorial elements so rigidly systematized that they will permit an observer to discern the speaker and the direction of the speech, the kind of utterance made, and the topic and comment of the utterance?" A soldier's uniform is not a pictorial element which can give a positive answer to the question cited; thus, although it may have its place in the general foundation of a visual sign system in real life, it cannot be said to belong to a

pictorial code.

Spaleny and Peprnik have made a different kind of analysis to explain how pictures can be improved as meaning-conveyers.¹⁴ They have listed in detail what they consider to be the basic principles of picture content, and the principles of conveying information. They are strongly opposed to audio-visual programs which depend on visuals to convey meaning because of the innate complicating features of pictures. Pictorial elements, they explain, can be placed in such a pattern that the observer can deduce a cause and effect relationship: a car is shown with a flat tire, and a broken bottle stands on the road behind it. It seems safe to assume that the observer will see the bottle as the cause and the tire as the effect. Parallelism may be achieved by showing dissimilar pictorial elements with similar indexical value: a car is shown with a flat tire and a worried-looking man beside it holding a hand-pump. It is possible that an observer will not see the tire immediately, but the indexical value of expression and pump should make the state of the tire quite obvious. The sequencing from picture to picture of the separate phases of a situation, and the break between the pictures are important. The sequencing must be suitable to the age of

¹⁴Eugen Spaleny, and Jaroslav Peprnik, "Foreign Language Teaching Picture as an Organized System," International Review of Applied Linguistics in Language Teaching, 4:171-183, November, 1967.

the observers. If what happens between two pictures has to be imagined, there must be sufficient clues in the component frames of the sequence to ensure that the imagined happening in the break corresponds to the author's intention.

It cannot be expected that "informations", "indices", and "signes" convey the same meaning when used as components of a picture as they do when they are the components of an actual situation. Semiotic elements constituting a code have not yet been identified for pictures however much producers and teachers of audio-visual programs of foreign language instruction would like it to be so. Picture 1, Simple Sequence C (Appendix A) was drawn to illustrate the message "Il y a des jouets partout" There are toys everywhere, and shows a housewife standing in a children's bedroom indicating scattered toys with a wide gesture. Unlike a living actuality, there are no indexical cues like the way the gesture is performed, the kind of eye movements, facial expressions, or volume, pitch, and intonation of voice to suggest whether the speaker is perturbed or tranquil. The author's intended message is the statement: "There are toys everywhere", but the gesture shown is one that often accompanies an exclamation in real life.

In an attempt to analyze the picture in the same way as a highway sign and a language sound pattern, several anomalies become clear. The gesture could be said to act at

the phonemic level of the analysis of the language code, but the other "phonemes" necessary to combine with it to make the "morpheme" of absence or presence of emotion cannot be illustrated. The other "phonemes" in this case would be "indices" like the way the housewife is gesticulating, her eye and head movements, and the characteristics of her voice. Because this gesture has not been established in a visual code to always convey the same kind of utterance, an observer would feel justified to interpret the picture as one of the following:

"Great scott, what a mess!"

"Do your children have as many toys as this?"

"You must pick up all these things at once!"

These interpretations indicate three different intentions of the speaker and three different directions of the utterance. In the first: "Great scott, what a mess!" the speaker makes an exclamatory remark and is perhaps talking to herself. In the second: "Do your children have as many toys as this?" the speaker is directing a question to a friend, and in the third: "You must pick up all these things at once," the speaker is probably addressing her children with a command. While such a range of possibilities of received messages from a single picture exists, it cannot be said that a visual code is in effect.

In the written form of English, certain graphic symbols have become conventionalized. This symbol "?" on a

written page always means a question; this one "!" signifies that an exclamation has been made, and an "X" in an arithmetical context can indicate that a mistake has been made. Graphic symbols are often seen in the visual part of audio-visual programs. An underlying assumption is that a large question mark on a picture stands out and is understood to indicate that someone has made an utterance in the form of a question. Such a picture is Picture 1, Compound Sequence X (Appendix A). An example of the symbol "X" superimposed on a picture can be seen in the frame immediately following the one just mentioned. This sign is meant to convey the idea of a negative by excluding the thing that has a cross drawn through it. In this case the previous question: "Do you have an apartment?" is being answered in the negative so a cross is drawn through the picture of the apartment in the balloon. The balloon, an ideographemic device, is one which is greatly used in Voix et Images de France. Once again, the assumption is that what is illustrated in the balloon is obviously the thing spoken about. To emphasize that the contents of the balloon do not belong to the multi-coloured main portion of a picture, they are illustrated in black and white only. Two people may be featured in conversation in the foreground of a picture, but their topic of conversation, shown in the balloon, may take place in the future or the past, and in a location different from the speaker's. The balloon is

expected to convey all information necessary to the intended message. An example of a picture including such an ideographeme is Picture 5, Compound Sequence X (Appendix A). Jacques is standing in the street speaking to his friend Pierre about his apartment shown in the balloon. If the balloon is accepted as a convention and if the figure in the window is recognized as the speaker, the viewer should know what is being spoken about and to whom the utterance is directed.

Malandain suggests that pictures featuring a balloon can no longer be interpreted spontaneously and intuitively, but require a certain amount of reflection and reasoning.¹⁵ He goes on to say that the child viewer is likely to become inhibited if pictures depicting pure situation are mixed with those demanding abstract thought.¹⁶ Another contention is that superimposed clarifying symbols should be shunned at all costs because they set up serious didactic obstacles.¹⁷ Spaleny and Peprnik, as was noted (page 12), outlined what they believed to be the basic principles of picture content. They do not condemn any specific kind of

¹⁵ Claude Malandain, Utilisation des Films Fixes pour l'Enseignement des Langues Vivantes aux Enfants (Paris: Didier, 1966), p. 136.

¹⁶ Ibid., p. 139.

¹⁷ Gerald Fleming, E. Spaleny, and J. Peprnik, "The Didactic Organization of Pictorial Reality in the New Language Teaching Media," Praxis des Neusprachlichen Unterrichts, 14:160-174, April, 1967.

picture as being too complex to be useful, but set down the principles upon which a picture should be composed if it is to convey information.¹⁸ The initial overall aspect central to the general meaning of the procedures concerning the field of attention, direction of movement through the sequence, and the shifting function of the pictorial elements have to remain constant. The redundancy of the picture must be controlled. Any disturbance like the omission of essential features must be reduced, and the inner redundancy, the personal factors particular to each individual, have to be exploited.

In the preceding paragraphs an attempt has been made to determine if the elements of composition of pictures used for educational purposes have been systematized into a code. The principles of de Saussure's analysis of the sound chain of language can be applied to the way the highway rules are depicted visually, but when the same principles are applied to pictures, generally no standardization of meaning and form is evident. Sound patterns are generally unambiguous conveyers of meaning, and highway signs are perhaps even more reliable in this respect, but pictures like those described above seem to be open to misinterpretation. For this reason, it is understandable that there is so much disagreement on the role of visuals in the foreign language

¹⁸Spaleny and Peprnik, loc. cit.

classroom. Criticism of visuals ranges from open condemnation, through wary scepticism, to complete faith.

Richardson can see futility in the attempt to explain all language visually because language is a vocal phenomenon and in no way visual.¹⁹ He claims that audio-visual programs are successful not because the picture gives meaning to the sound, but because the sound gives meaning to the picture. Coppen, holding many doubts about visual materials, states that the emphasis must be on knowledge of the student: the aid must be an intensely subjective tool reflecting an appreciation of the student's personality, needs, and background.²⁰ Cole contends that pictures do not necessarily convey situational meaning, and that an explanation in the mother tongue may sometimes be essential.²¹ Fleming is especially impressed by cartoons as the form of

¹⁹G. Richardson, "The Use of Visual Aids in the Teaching of Modern Languages," B. Libbich (ed.), Advances in the Teaching of Modern Languages (New York: The MacMillan Company, 1964), p. 151.

²⁰Helen Coppen, "The Search for Evidence. What Do We Know About the Ways in Which Audio-visual Aids Help Learners to Learn?" Visual Education, (August-September, 1968), pp. 71-74.

²¹Leo R. Cole, "The Psychology of Language Learning and Audio-visual Techniques," Modern Languages, 4:166-171, December, 1968.

the visual,²² and like Garibaldi and Strasheim,²³ and Brown,²⁴ accepts visuals as a vital part of the foreign language program. The emphasis here is on the picture as the cue in the teaching strategies and not as the conveyer of meaning. This sort of picture is what Mackey calls the mnemonic visual.²⁵ Meaning is to be established first and then the picture may help the student to memorize, promote dialogue, reinforce previously learned material, or to test his knowledge. The picture frames that Dodson used in his studies yielded disappointing results.²⁶ He was not certain that all his subjects could successfully interpret them. He realized that commercially prepared programs are doomed to suffer because the school administration does not always allow the teaching procedures recommended by the program manufacturers. He demonstrated that the lack of correct meaning detrimentally affected the ability to imitate correctly.

²²Gerald Fleming, "Language Teaching with Cartoons," Film User, (June, 1964).

²³Virginia Garibaldi, and Lorraine A. Strasheim, Visual Aids Handbook for Foreign Language Teachers, Indiana Language Program (Bloomington: Indiana University, 1960).

²⁴T. H. Brown, "Using Visual Cues as an Aid for Memorizing Dialogue," Modern Language Journal, 47:363-366, December, 1963.

²⁵William Francis Mackey, Language Teaching Analysis (London: Longmans, Green and Co. Ltd., 1965), p. 245.

²⁶C. J. Dodson, Language Teaching and the Bilingual Method (London: Sir Isaac Pitman and Sons, Ltd., 1967), pp. 4-16.

The foregoing discussion presented the problems inherent in the process of transferring the meaning of a message from verbal to visual form, and the reverse process of changing this pictorial pattern into a linguistic structure. The direction of the transfer from the heard medium to the seen is essentially the program author's task, and from the seen to the heard, the learner's. It is unnecessary that the learner be aware of the theories of communication systems or the scientific construction of teaching aids. His function in the ideal teacher-learner design is to make the appropriate response to a stimulus. While one cause of a student's false response can be traced to the discrepancies in the make-up of the stimulus, there remains another source of error which must be taken into account.

There is no guarantee that any given combination of units, even in an established code, will, at any given time, suggest the same meaning to all people. There are personal factors, varying from individual to individual that can be the source of errors in interpretation. As was mentioned in the discussion of the highway code, different cultural backgrounds in motorists can affect the meaning-conveying quality of a sign. A parallel case can be drawn at the classroom level: a teaching program employing visuals to set the authentic situational context for the accompanying foreign language dialogue may include bewildering elements.

If the learner understands the target language, the dialogue will immediately clarify what the picture conceals, but the beginning student, lacking in knowledge and uncertain of the meaning of the new sounds, must almost completely rely on what he sees as a way to understand what is meant. A picture of the front of a classroom showing a teacher with one arm outstretched with bunched fingers and extended thumb would not convey the same meaning to students from English and French cultural backgrounds. In French, this position of the thumb belongs to the gestural system of signs and could accompany an utterance with a translated meaning like "There was only one of them", whereas in English such a posture of the thumb is not generally used to convey the idea of unity. A picture like this one accompanying a French dialogue in an audio-visual foreign language program would not convey to an American learner the message intended by the program author. It would seem that the simplest pictures to interpret are those depicting familiar people doing everyday things with common objects in known locations. Nevertheless, the use of authentic cultural situations is imperative if the true semantic qualities of the target language expressions are to be conveyed even if they carry with them difficulties of their own.

The meaning-conveying capacity of a picture can be obstructed by individual personality differences as well as

by variations in cultural background. However, it is well to tread warily when examining the psychological implications of picture interpretation. Forgas points out that it is over-simplistic to say that a subject sees what he is conditioned to see.²⁷ People are culturally conditioned to have certain perception patterns but the clarity of the stimulus seems to be the decisive factor. When a picture's meaning is obvious, a variety of individual interpretations is minimized. It is only when the meaning is obscure -- when the viewer is uncertain -- that individual characteristics are going to cause a diversity of responses. At this level such factors as emotions, experience, sensitization, set, and attitudes could play a dominant role.

Vernon emphasizes the danger of generalizing about individual perceptual skills. Even though there are differences in perceptual ability from person to person, there is no pattern of perceptual efficiency in any one person. Any single person tends to be more able in some perceptual situations than in others, but it is uncertain how training, experience, and innate ability influence this qualitative variation.²⁸

Dodson produced a related finding in his experiment with primary level children. He showed that one particular

²⁷Ronald H. Forgas, Perception (New York: McGraw-Hill Book Company, 1966), p. 267.

²⁸M. D. Vernon, The Psychology of Perception (Hammondsworth, Middlesex: Penguin Books Ltd., 1962), p. 241.

child may grasp the meaning of one particular picture but cannot grasp that of another, whereas a second child may perform in the reverse way: the picture he understands may well be the one the first child fails to grasp.²⁹ The teacher has to face the problem of determining which pupil has the correct meaning and which has not.

This chapter has attempted to outline the principal areas where problems in the process of interpreting pictures are more likely to arise. If pictures are to act as a communication system, there will have to be standardized combinations of illustrated elements always signifying the same thing. The less universal is the link between the "signifiant" and "signifié" of a visual sign, the less likely is the system to which that sign belongs to be a successful means of communicating messages. If combinations of pictorial elements are not sufficiently conventionalized to constitute a code, the fault may be in the essential nature of pictures themselves: there may be intrinsic qualities which do not lend themselves to regulation because pictures are what they are. To further complicate an already complex problem, individual differences of personality, and social and cultural background can conceivably be major sources of difficulty in understanding visual conveyers of meaning. Justification for this study is established by the evidence that indicates that pictures, for

²⁹Dodson, op. cit., p. 9.

whatever reasons, do not necessarily do what program authors intend them to do: convey an intended message with precision..

CHAPTER II

A REVIEW OF THE RELATED RESEARCH

I. INTRODUCTION

The review of related research will be organized around two aspects of the teaching situation in the foreign language classroom. The first aspect deals with some of the procedures in audio-visual methodology. Some variations of particular steps in a lesson are examined to see if one way of proceeding is more practicable and fruitful than another. The second aspect concerns the psychological implications of audio-visual instruction.

Malandain's¹ experiments shed light on problems implicit in:

(1) The picture. He has examined the different media for presenting the picture and the different modes of picture presentation. There are possibilities of chronological grouping, grouping around the actions of principal characters, or grouping by smaller situations within the larger context.

(2) The relationships between the linguistic signs and pictorial signs.

(3) The pupil. In his studies of the learner he has

¹Claude Malandain, Utilisation des Films Fixes pour l'Enseignement des Langues Vivantes aux Enfants (Paris: Didier, 1966).

sought to discover the appropriate step at which to seek response to the visual stimulus. One problem he attempted to explore was whether the pupil should be confronted with the picture at the time of interpreting it or whether he should rely on remembering what he had seen.

Guénot, Sturge-Moore, and Tardy² have done further work in some of the isolated functions and psychological implications of methods employing audio-visual aids to teach a second language. Their conclusions lead towards a better understanding of:

(1) The growth and nature of a picture-reading capacity.

(2) The elements of a pictorial composition most favourable to correct interpretation of the total composition, and the most appropriate kind of picture for classroom needs.

Dodson,³ on the other hand, has structured his experiments around actual classroom situations and the integration of the various teaching procedures involving pictures as stimuli. He has drawn conclusions about:

(1) The general quality of visuals in commercially produced courses.

(2) The relationship between the pictorial representation of sentences and the acquisition and retention of

²J. C. Guénot, C. Sturge-Moore, and M. Tardy, "La Lisibilité des Vues Fixes," Études de Linguistique Appliquée, Faculté des Lettres et des Sciences Humaines, Université de Besançon (Paris: Didier, 1962).

³C. J. Dodson, Language Teaching and the Bilingual Method (London: Sir Isaac Pitman and Sons, 1967).

their meaning.

(3) The comparison of the effects of different combinations of the same stimuli on speaking skills.

(4) The relationship of different stimuli to the time required to reach a certain standard in classroom skills.

II. THE RESEARCH

Ways of Presenting the Visual

The subjects with whom Malandain worked were French children from French schools. One assumption was that the French student confronted with a picture but no sound accompaniment is in the same psychological situation as a beginner in French undergoing a program like Voix et Images de France. Both the student and the beginner see a picture but neither is helped by the commentary. When hearing the French expressions the beginner who is not familiar with them cannot understand the message they carry; therefore, he relies entirely on the picture to give him the situation or concept which underlies the spoken statement. Furthermore, it must not be forgotten that both the student and the program authors share the same cultural heritage which is reflected in the pictures.

Malandain's sample were children from these levels:

(1) Cours préparatoire (C.P.) -- children of age 6-7 years.

(2) Cours élémentaire 1^{re} année (C.E.1) -- children of age 7-8 years.

(3) Cours élémentaire 2^e année (C.E.2) -- children of age 8-9 years.

(4) Cours moyen 1^{re} année (C.M.1) -- children of age 9-10 years.

(5) Cours moyen 2^e année (C.M.2) -- children of age 10-11 years.

His investigations always involved the groups C.P., C.E.1, C.E.2, and C.M.1 but not always C.M.2. The results of C.M.1 and C.M.2 are more pertinent to the present study because of their corresponding age level. The groups were divided into two sections each of which was given a different presentation of a sequence of pictures about the daily routine of La Famille. The sequence was either projected onto a screen or presented on paper. Each subject was given an individual presentation and the investigator wrote down his oral interpretation of the story. After classifying the responses obtained into enumerations, descriptions, and interpretations, the hierarchy of ability in picture comprehension, the investigator saw that although enumerations made up a small percentage of the responses, they disappeared completely at the C.M.1 level. Whereas descriptions formed the largest proportion of the results in the group given the presentation on paper, they progressively decreased as the chronological age of the

sample group increased. Interpretations, which were scarce at the C.P. level, increased constantly for each group up to the C.M.1 level.⁴

The analysis revealed that scholastic level played the determining role in the comprehension of pictures and that the other factors, mental age, chronological age, and type of presentation afforded only minimal modifications. Malandain does not explain how he dissociated chronological age from scholastic level, nor is it apparent how scholastic level can be independent of chronological age. At the C.M.1 level almost all of the children were capable of interpreting the pictures correctly and, above all, their responses were closer to what was intended.⁵ Chronological sequencing was not perfectly handled until the C.M. level.

Perception and Recall of Pictures

In a study of perception and recall Malandain used samples from the C.E.1 and C.M.2 levels. His material was three sequences from Voix et Images de France. There were two main steps in the procedure. In the first, the sequence was shown twice to the student who was then told the complete story; in the second, the sequence was shown one picture at a time and the student gave a commentary after each one. It was found that the number of units of

⁴Malandain, op. cit., p. 20.

⁵Ibid., p. 52.

information increased regularly from the C.E.1 to C.M.2 levels.⁶ The C.M. level was capable of interpreting pictures irrespective of the contents of the film.⁷ There were more correct responses at every level after Step 2, the reproduction with pictures, than after Step 1, the reproduction from memory.⁸

The Initial Impression Made by the Visual

Malandain then formed two groups, the first of which had correctly interpreted the whole sequence; the second had not. Their results with Step 2, the reproduction with pictures, were examined and the percentages of correct interpretations compared. The evidence indicated that the child's first impression of the filmstrip situation is all-important. The child who does not immediately understand the unfolding of the situation will encounter a handicap at the time of further picture analysis. He may never overcome his initial inability, and by the phenomenon of perseveration will retain the tendency to make the same mistakes.⁹ The interpretation of pictures at the C.M.2 level was correct in 75 per cent of cases, and success was as good at the stage of recall as at perception. When the sequence was simple and logical, the children could understand it and tell the whole story without error.¹⁰

⁶Ibid., p. 80

⁷Ibid., p. 83.

⁸Ibid., pp. 90-91.

⁹Ibid., p. 92.

¹⁰Ibid., p. 93.

Different results were noted for the La Famille and the three Voix et Images de France series. These were due in part to differences in the kind of sequence; familiar and obvious on the one hand (La Famille), but more subtle and not so commonplace on the other (Voix et Images de France). The method of experimentation was also slightly different. In La Famille the students were questioned in the presence of the pictures; in Voix et Images de France the pictures were absent. It was suggested that for better results, the students be encouraged to be active -- to use their own exploratory techniques -- when viewing the pictures, and that the teacher make the conditions for perception as favourable as possible. This was considered vital at the levels prior to C.M.2, at least.¹¹

The Mode of Presenting the Visuals

In a study of the importance of the mode of presentation on the understanding of pictures, Malandain used so small a sample that no conclusion could be drawn. However, certain trends were indicated and these are noteworthy.

The whole sequence of La Famille and one complete sequence from Voix et Images de France were presented in different ways. La Famille lends itself to the grouping of the pictures around certain times in the day, or around the

¹¹Ibid., p. 94.

individual characters. Thus, three groups were formed:

(1) Group A was presented the pictures successively and in chronological order.

(2) Group B was presented the pictures successively and arranged according to the actions of the individual characters.

(3) Group C was shown the pictures grouped into four sequences. A group of four pictures was shown at the one time. Four sequences were shown successively because there were sixteen pictures in the total sequence.

Groups A and B saw the pictures one at a time and interpreted each picture as it was shown. The same procedure was then repeated. The second time through, the students had the benefit of knowing the full context of each picture before attempting interpretation.

In brief, the pertinent results of this study are that a grouped presentation aids in conveying the complete situation and makes perception more uniform. That is, it minimizes the number of different individual responses. Successive presentation forces the child to analyze in detail, and the answers are more elaborate and more complete. The two means of presentation complement each other.¹²

The following hypothesis of Malandain is important to the present study because what he suggests was a consideration when the method of procedure for the

¹²Ibid., p. 107.

experimental group was shaped.

Let us imagine, first of all, the situation of the pictures presented successively: when the child has perceived the first picture, he retains a certain representation of it which directs the perception of the second picture. The representation of the first two pictures direct, in the same way, the perception of the third picture, etc. . . . Now the faculty of memory being selective, it can be thought that the memory left by the perception of the first two or three pictures differs from one child to another, each having retained the elements which to him appear to be essential. Under these conditions, each child confronts a new picture with a slightly different perceptive schema, and this difference tends to be progressively accentuated as the pictures go by.

This phenomenon is less marked when the pictures are presented in groups.¹³

In a further analysis of the results of Groups A and C, it was seen that there should be a limit on the number of pictures presented. A child forgets what he has already seen, and loses the thread of the film after seven or eight pictures, but this number depends on individual aptitudes.¹⁴

The presentation of the sequence from Voix et Images de France was similar to that mentioned above for La Famille. Once again the sample was very small -- thirty children from C.M.1, C.M.2 -- so the findings were inconclusive. The results, however, did substantiate and reinforce those from the La Famille part of the experiment:

¹³Ibid., (Relevant citation translated by the writer of this study), p. 106.

¹⁴Ibid., p. 110.

(1) Memorization of the pictures was facilitated by grouped presentation.

(2) The correct interpretations were greater when the pictures were grouped.

(3) The more difficult pictures yielded a better interpretation in a grouped presentation.

(4) Grouped presentation favoured perception of the whole but at the expense, it seems, of analysis.¹⁵

The Relative Roles of Visual and Sound

Malandain sought to explore the relative roles of the visual and sound elements in the filmstrip sequence "Histoire du Bateau" from "Promenade au Jardin du Luxembourg" from Voix et Images de France.¹⁶ He divided thirty children from each of the C.E.1 and C.E.2 levels into three equal groups:

(1) Group A saw the pictures without the accompanying commentary.

(2) Group B heard the commentary only.

(3) Group C saw the pictures and heard the commentary at the same time.

Each child was given the treatment individually. The whole of the material was presented and the child recounted the story. This procedure was repeated. The results showed that the pictures yielded more varied and imaginative

¹⁵Ibid., p. 109.

¹⁶Ibid., p. 119.

responses. The commentary restricted originality, and the child found it difficult to imagine the situations which could promote the dialogue he heard. He appeared incapable of imagining anything different from what he heard. In structuring his perception and judgment, the accompanying commentary suppressed errors of interpretation.¹⁷

These results may not be precisely what would be expected from groups learning a foreign language. Malandain has experimented with French children in their own tongue. Although they were fully conversant with the language, they had never before seen the visuals. If, however, the filmstrips reflect French culture, French children are not going to be confronted by strange elements as are children who do not live in France. He argues that the role of language in this audio-visual method varies as the student becomes progressively more proficient. At the outset the new sounds are worthless as a means of conveying meaning. Gradually, they add more understanding to the visual, and eventually the roles of visual and sound are reversed: the language provides the structures on which meaning hangs, and the picture reinforces and fixes the meaning.

Malandain himself says that his results are not definitive. His aim is to provoke thought among teachers and to offer possible explanations of certain problems.¹⁸

¹⁷ Ibid., p. 130.

¹⁸ Ibid., p. 142.

He points out the significance of his studies for foreign language teaching. The student understands a dialogue with difficulty: a situation comparable to seeing a picture without sound. He may, on the other hand, immediately understand some of the dialogue. He will then structure the picture around the few elements he knows well. The evidence suggests that there should be separate presentations of sound and pictures.¹⁹

Progress in Picture-reading Capacity

Guénot, Sturge-Moore, and Tardy carried out a project for which there were two principal hypotheses:

(1) That there would be a phenomenon of progress in the capacity to read a picture.

(2) That the rhythm of this would probably not continue.

It was supposed that a level would be reached rather quickly, and the problem of "training" would be resolved.²⁰

The material used was lessons 1, 4, 7, 10, 13, and 17 of an audio-visual course for people learning English. The control group comprised French people who were not acquainted with the method; the experimental group was made up of well-educated adults between the ages of twenty-four and fifty who were learning English by the method. It must

¹⁹Ibid., p. 132.

²⁰J. C. Guénot, C. Sturge-Moore, and M. Tardy, "La Lisibilité des Vues Fixes," Études de Linguistique Appliquée (Paris: Didier, 1962), p. 109.

be noted that only the experimental group was examined under the study conditions.

The control group was to be shown the series and told to construct a suitable answer for each of the pictures. The experimental group had a similar treatment but their "tests" were given at the appropriate time as their program progressed. That is, the "test" for Lesson 2 came at the end of Lesson 1, and the "test" for Lesson 3 came at the end of Lesson 2 . . .

The presentation of the pictures of the new lesson, which was always given at the end of the class period of the previous lesson, was done in French, and the English was withheld at this point. The teacher made certain of the exact interpretation of the pictures, and it was not until the beginning of the next lesson that the sequence accompanied by the target language commentary was given.

An examination of the results suggested that there was an increase in the subjects' capacity to read pictures, and the intervention of the teacher (as described) helped this training effect.

Certain lessons yielded better results than others. Suggested explanations were:

- (1) Variation in the quality of pictures.
- (2) Later lessons were grammatically more complex.
- (3) The complexity of certain expressions do not permit unambiguous visual representation.

By a comparative analysis it was shown that individuals confront a new language in a variety of conflicting ways. Some have a tendency to guess, others to doubt, others to be more precise. However, towards the fifteenth lesson the differences among the subjects became less great.²¹

A particular study was made of Lesson 7. Nine British students saw it and each submitted a fitting dialogue. This was their first contact with the material, and they became the control group for the French students familiar with the method. A comparison of the suggested dialogues revealed that the British students gave 55 per cent acceptable responses, while the French beginners gave 66 per cent. Those who were accustomed to the method were less inclined to expand or embellish the text -- they saw the essentials. They also produced a smaller proportion of gross errors.²²

The Quality of Pictures

Thirty university graduate linguists and university lecturers attempted to guess the sentence meanings portrayed in the frames of complete lessons (twenty frames per lesson) from audio-visual courses then on the market. After the first viewing their average score of correct meaning was approximately 20 per cent. The commercial courses were

²¹Ibid., pp. 112-126.

²²Ibid., p. 126.

little better than the worst set used in Dodson's study on primary pupils, and indicated that a great deal of research remains to be done on picture composition and visual inference.²³

Another analysis by Guénot, Sturge-Moore, and Tardy brought forward a list of qualities of pictures that either aid or hinder understanding.²⁴ It was suggested that each picture could be analyzed from two complementary points of view:

(1) An exhaustive description of the elements contained therein -- number of people, number of objects, number of conventional signs, actions, gestures, colours. . . .

(2) A study of the organization of these elements -- relative size, relative positions of the objects or elements, relationships between gestures and objects, relationship between the objective situation and the imagined representation in the "balloon"²⁵

At this point, the conclusion of the summary of the study conducted by Guénot, Sturge-Moore, and Tardy, it is well to emphasize the fact that their work was done on a restricted number of subjects. Thus, their results cannot be considered as certain but they can shed light on some of

²³C. J. Dodson, Language Teaching and the Bilingual Method (London: Sir Isaac Pitman and Sons, Ltd., 1967), p. 8.

²⁴J. C. Guénot, C. Sturge-Moore, and M. Tardy, op. cit., p. 128.

²⁵Ibid., p. 133.

the psychological problems of the readability of film-strips, and the phenomenon of the increasing aptitude to read pictures. Guénot, Sturge-Moore and Tardy show that case studies are necessary to point up the individual differences in attitudes, personality traits, rhythm of progress, and variation in rates of progress that emerge with confrontation with the same material.

Acquisition and Retention of Sentence-meaning

The aim of one of Dodson's experiments carried out with both primary and secondary level pupils and with adults, was to ascertain how people of different ages can best acquire and retain sentence-meaning while taking part in an active language learning process not connected with meaning acquisition.²⁶ The additional process was that of spoken sentence imitation: a strategy which often takes place while sentence meaning is still evolving in the student's mind. Since the primary level group would be of similar age to the subjects of the present study, only the results pertaining to them are reported.

This group had already followed a twelve-month language course wherein they had encountered different modes of presentation for the acquisition of meaning. Each individual student of the group of twenty-six was presented with:

²⁶C. J. Dodson, op. cit., pp. 4-11.

(1) Two groups of three spoken foreign language sentences with specially prepared pictures representing the meaning of the sentences. The tester also made use of actions, objects and qualities to reinforce clarity of meaning.

(2) Two groups of three spoken foreign language sentences together with specially prepared pictures representing the meaning, but initially the pupils were given the mother tongue equivalent after which the tester offered no further help.

(3) One group of three spoken sentences together with the mother tongue equivalent of the sentences at the beginning of each sentence practice, but no pictures or other help.

Each child was tested separately in an experimental room, and every sentence was spoken fifteen times by the tester. The child had to imitate each spoken stimulus; after every third imitation response the child was asked to give the meaning of the foreign language sentence he was producing, thus making a total of five meaning checks per sentence. The subjects in the second category (above) were given, when necessary, a correction of meaning after the third check.

From the report of this experiment there is no way of knowing the order of presentation of the different modes of presentation, so it is impossible to verify the

possibility of a training effect. The sentences were not cited so their degree of difficulty cannot be checked.

Dodson's findings were that:

(1) The acquisition and retention of sentence-meaning were far and away more efficient for the people who received the mother tongue equivalent and the pictorial illustration of the sentences. The mode without pictures would have required more repetitions and meaning checks before it yielded one hundred per cent correct meaning responses.

(2) Unless a child is capable of immediately understanding a picture, it is probable that he will never hit on the correct meaning no matter how often the picture is shown or what the teacher does as clarification. Questions and answers in the foreign language do not necessarily help meaning: the pupil learns to imitate and give a learned response triggered by a remembered stimulus.

(3) . . . any uncertainty of meaning has a detrimental effect on the pupil's ability to imitate and mimic spoken FL sentences. The experiments showed that the average primary, and secondary child is not able to cope efficiently with two distinct thought processes simultaneously. He cannot easily focus his attention on the acquisition of sentence-meaning whilst at the same time making efficient spoken imitation responses. Furthermore, the pupil has difficulty in retaining the meaning of a sentence after he has acquired it when he is struggling to mimic the teacher's spoken FL sentences.²⁷

²⁷Ibid., p. 10.

The Combination of Stimuli to Yield the Best Response

Dodson carried out an experiment to determine the most favourable combination of stimuli which would produce the best results during imitation exercises.²⁸

The group of primary level children were given four different combinations of stimuli:

(1) Foreign language spoken word, picture, foreign language printed word.

(2) Foreign language spoken word, picture.

(3) Foreign language spoken word, mother tongue equivalent, picture, foreign language printed word.

(4) Foreign language spoken word, mother tongue equivalent, picture.

The possible variable of sentences of unequal pronunciation difficulty was controlled.

Each individual pupil had to respond to each of fifteen spoken stimuli for every sentence. Every response made was evaluated as to fluency, accuracy, and pronunciation. Any response which did not satisfy one or more of these factors was deemed to be incorrect.

The results showed that where the mother tongue equivalent was the only difference between groups, the group with this factor yielded better results. The second presentation (foreign language spoken word, picture) is the

²⁸Ibid., pp. 11-16.

technique recommended by the authors of audio-visual courses but the combination of "meaning-uncertainty" and the absence of the printed word made it the least efficient of all the tests conducted in this study.

Efficiency in the Learning Process

Because teaching time is always a scarce commodity, Dodson made a group comparison of the time required to complete the tests just mentioned.²⁹

The greatest amount of time was taken by those experiments in which the pupils were not given sentence-meaning by the initial mother tongue equivalent. He found that the best possible combination of stimuli for the most efficient learning and consolidation of foreign language material was:

(1) Foreign language stimulus.

(2) Mother tongue equivalent for the acquisition of sentence-meaning.

(3) Pictures and other visual aids for the retention of sentence-meaning.

(4) Availability of the foreign language printed word for improved imitation performance.

It goes without saying that this is what Dodson considers as the most desirable order of the stimuli. From the reports of his experiments it would appear that he has

²⁹Ibid., pp. 14-15.

chosen to present the pictorial stimulus after its intended meaning has been established.

III. SUMMARY

In summary, specific references will be made to those findings which are common to the investigators cited, or which include radical basic differences.

The Use of the Mother Tongue

In his experiments evaluating different stimuli, Dodson gives preference to the mother tongue equivalent of the message over the picture intended to convey the message. His intention was to combine quantity with quality of teaching effort in the hope of saving classroom time so that more teaching could be done. Guénot, Sturge-Moore, and Tardy showed that a mother tongue interpretation could be of benefit in the audio-visual program.

The Importance of the First Impression of the Visual

Malandain and Dodson agree that the first impression of the visual is lasting and restraining, and therefore, must be accurate.

The Debatable Ambiguity of Pictures

All three researchers mentioned showed conclusively that skill in picture interpretation can be improved. This, however, may or may not be evidence that the pictures themselves are ambiguous. If they are ambiguous, it must be

determined whether the ambiguity stems from the non-existence of a visual code or the learner's ignorance or non-recognition of an existing code. The fact that skill in interpreting pictures can improve could suggest that pictures possess the latent qualities necessary for codification.

The Combination of Stimuli to Yield the Best Response

The outstanding difference between Dodson's premises and those of the other researchers is the position appointed to the picture in the stimulus combination. Dodson advocates an eclectic method which he calls the Bilingual Method while, generally speaking, Guénot, Sturge-Moore, and Tardy, and Malandain have followed what seem to be standard procedures of teaching by the audio-visual method. The latter group of four investigators were not so much concerned with the sole purpose of evaluating and improving the method as with uncovering trouble areas that may be natural to it. It should be remembered that Dodson worked with visuals made by an individual teacher, whereas the others used a highly refined commercial product.

CHAPTER III

THEORETICAL BASIS

Gauvenet and her fellow authors have outlined their theory of the audio-visual method which they have called the audio-visual global and structural method in these words:

First we set off with situations expressed by a succession of pictures. The language is the verbal expression of the reality. The picture is the basic element which presents this reality before even the language. This is why each picture precedes the sentence by several seconds, and is obliterated after it. Thus the picture constitutes the psychological bridge which allows us to pass easily from our mother tongue to the foreign language.¹

In order that this be so, the author must be as certain as possible that the picture conveys the meaning that he intends. While composing the picture, he must realize that it reflects his own interpretation of reality because it is a product of his imagination. He chooses from reality the things he wants or needs in order to express a given situation. If the viewer can transfer the intended reality of the visual form into the appropriate verbal form in the mother tongue, it would seem that he is ready to learn a new sound pattern to represent the same situation. However, when the picture has been removed, understanding in the

¹H. Gauvenet, P. Guberina, P. Neveu, and P. Vettier, Méthode Audio-visuelle de Français (Paris: Didier, 1965), (Relevant citation translated by the writer of this study), Preface.

native language will not necessarily prevent interference between the native language and the target language. Understanding in the one will not necessarily lead to understanding in the other because, although the concepts are similar, the "signifiants" have little in common. The perfect foreign language program based on the audio-visual global and structural method would be made up of pictures that elicit the same interpretation in different observers, in other words: the pictures able to transmit a universal, or close to universal, meaning for a given culture.

For the purposes of this study the assumption is made that the amount of disagreement between the intended message predetermined by the program author and the received message perceived by the student can be evaluated by a comparison of both these messages.

The received message of a sequence of pictures can perhaps be explained as being dependent on these factors:

(1) An understanding of each of the component pictures.

(2) An understanding of the immediate context of every picture.

(3) An understanding of the total context of each smaller context.

(4) The amount of training the subject has had in similar interpretive work.

(5) The individuality that every subject brings to

the task. There may be endless possibilities of causes of variation in responses. Some of the factors that could be combined in any one person are: cultural experience, maturity, attitudes, interests, sensitization, expectancy, value judgments, anxiety, and innate ability such as intellectual efficiency.

This study is concerned with the first two of these factors. Understanding of the total sequence is assumed to be a function of success in interpreting the component pictures separately.

I. INFLUENCE OF THE PREVIOUS RESEARCH ON THE PRESENT STUDY

Malandain contends that the picture interpretive skill of youngsters at the 11-12 age level is almost the equivalent of adults. This conclusion was derived from analyses of test results from children sharing the same cultural environment as the pictures they saw. Voix et Images de France was originally produced for older teenagers who were young adult immigrants to France. Although they would know nothing or very little of the language, they would, nevertheless, be totally immersed in the French cultural setting. Edmonton students beginning the same program are neither what we class as young adults nor are they culturally orientated to France. It seems that in some of the sequences from the program, different cultural

elements like "concierge", "salle de bain", and the way that houses are numbered could inhibit understanding.

Guénot and others, Malandain, and Dodson point out the different kinds of response that spring from personality differences. These responses are so varied that it seems that the teacher should channel and guide interpretation of the pictures, and lead the student to personal understanding without frustrating his mental activity. In the present study English is used to clarify and draw attention to the importance of the pictorial elements which are vital to correct interpretation.

Malandain showed that a fuller comprehension of a total situation comes through best when grouped pictures are presented, but that successive presentation promotes detailed analysis. Filmstrip projectors are currently in use for teaching Voix et Images de France, and they do not permit grouping. The present study shows all of the frames of each sequence successively so that a total-situation understanding can be achieved. The English clarification dealing with one frame at a time follows, and there is a second successive presentation. In this way it is hoped that the first viewing will transmit at least some of the general understanding, the clarification will add detail and elucidate meaning, and the last viewing will synthesize the foregoing.

Malandain claims that there should be a restricted

number of frames in any sequence. He suggests seven or eight but allows for individual capacity. The number of frames in the present study is six in six out of the eight sequences (the remaining two have five frames each). Each sequence forms a linguistic as well as a situational unit.

The explanation of the different roles of visual and sound given by Malandain has an important bearing on the present study. The picture encourages individuality and creativity; the sound structures understanding and deters individuality. The question arises: should we look for fewer interpretive mistakes by offering the meaning in words first, or should we accept a degree of non-conformity and induce activity of the imagination by showing the picture first?

This study has attempted to achieve the most desirable compromise. The pictures are shown to stimulate the imagination, and the clarification treatment has the same ideal in view. The clarification is not a direct translation of the commentary or a narration in indirect speech, but a process of pointing out, implying, and suggesting interpretive possibilities.

Guénot appears to have devised a more appropriate method of clarification. The new lessons were presented and clarified a day previous to the start of intensive study of them. The juxtaposition of the mother tongue and the target language was prevented from causing problems and

encouraging translation. This method, however, was not practicable for the present study because of restrictions in the use of class time and organizational and sampling difficulties that would arise in working with junior high schools.

II. STATEMENT OF THE PROBLEM

From what has been written by educational theorists, and from the evidence produced by investigators, a margin of error exists between the intended and received messages of a picture in sequence. One purpose of this study is to examine such interpretive differences after sequences of pictures have been presented with and without any accompanying clarification. It is suggested that the interpretation of pictures shown in sequence will be more accurate after it has been assured that the viewer has seen and recognized the elements in the pictures.

It is further suggested that the treatment for sight and recognition is especially important where the pictures contain graphic symbols or ideographemic elements, and are in a context of similarly composed pictures.

It is possible that the accuracy of interpretation is influenced by the time that the picture is exposed for examination. Pictures simple in their content may be immediately understood but those of more involved composition may require a longer examination. A further purpose of this

study is to determine if the time factor helps the viewer to make a more perfect interpretation.

The total message conveyed by a picture has several integral parts, each of which has its own relative importance. Another purpose of this study is to determine to what degree the total message depends on each of its parts, and how they are related to each other.

III. LIMITATIONS AND DELIMITATIONS

Limitations

(1) The smaller contexts of five and six pictures were taken from larger contexts, so whatever aid may come from exposure to the broader context must be taken into account.

(2) The subject's impression of the picture is sought by written expression; if his interpretation is incorrect, it may be that he has misunderstood or that he has difficulty expressing himself.

Delimitations

(1) The sample of sequences are restricted to those found in the first five lessons of Voix et Images de France; therefore, any generalizations must be limited to this material.

(2) The French commentary normally accompanying each picture is not given. If, under classroom conditions, help is added by the dialogue, the relevant findings of

this experiment must be looked at with this factor in mind.

(3) The sample of subjects comes from grade six pupils who began a different audio-visual program, Bonjour Line,² at the beginning of grade five. Any generalizations must be restricted to this group.

(4) The responses under examination are analyzed under four headings: direction, modality, content, and message.

IV. DEFINITIONS

Direction. This is the recognition of: (a) who is speaking, and (b) to what feature inside or outside the picture the speech is directed.

An example of how the direction of the message is interpreted may be seen in Picture 1, Simple Sequence A (Appendix A) for which the intended message is "Voilà sa maison." Marie is the narrator and is talking about Michel Thibaut. If the student offers, "This is where I live", this is not considered an error in direction because Marie could conceivably be speaking to the audience about herself.

If "You are entering the apartment building" had been

²Bonjour Line, Méthode d'enseignement du Français aux enfants étrangers de 8-11 ans, C.R.E.D.I.F. Publiée sous le Patronage de l'Association pour l'Education, la Science et Culture (Paris: Didier, 1963).

offered, there would have been a mistake. Marie has been misunderstood as speaking to Michel Thibaut and not about him.

Modality. This is the social rapport established in the message. It will be either: (1) assertion, (2) request or command, (3) question, or (4) greeting and social situation response. It is the type of utterance made, but it is determined by how the utterance functions in the dialogue: it is governed by the intention of the speaker. An utterance may have the structural appearance of a particular kind but may, in essence, be something different.

An example of how the modality of the message is interpreted may be seen in Picture 6, Compound Sequence Y (Appendix A) for which the intended message is, ". . . à gauche . . ." The concierge is talking about Françoise's apartment and "à gauche" is the modifying phrase. The student's received message "turn to the left" is correct although "turn" normally implies an imperative. "Turn to the left" is a conventional method of describing a direction; the concierge is not saying "turn" with the intention of imposing his will on Jeannette.

Content. The content of the message has two basic components: the topic and comment. The topic is what is being spoken about, and the comment is what is said about

the topic: it is any kind of predicate. The topic and comment do not necessarily occur in that order, and are not always uttered in the message under examination. An example of this is in Picture 4, Simple Sequence C (Appendix A) for which ". . . sur les meubles. . ." is the intended message. The topic is "des jouets" and it is implied in this speech, but spoken in Picture 1 of the same sequence, "Il y a des jouets partout." It is essential, on occasion, to look at a student's previous and following responses to decide if he has the correct topic. The pupil's meaning may be appropriate for the picture in isolation but his answer may indicate that he has not correctly placed the picture in the sequence.

The content is the semantic meaning of the utterance. There are two decisions to be made: (1) does the received message show that the picture in sequence has been understood, and (2) is the received message closely enough related to the intended message to suggest that no confusion will occur when the corresponding foreign language structure is given? In Picture 6, Compound Sequence W (Appendix A) the intended message is "Monsieur Thibaut est ingénieur." The basic components of the message are the topic, "Monsieur Thibaut", "Mr. . . .", "that man", or "he", and the comment is the predicate noun, "ingénieur", "engineer", "draughtsman", "architect", . . . A similar syntactic structure with equivalent semantic

content to the intended message is "He is a draughtsman"; a dissimilar syntactic structure with similar semantic content is "This man works in a drawing office", so the content of this response is considered correct.

It is possible to have the direction and modality wrong but the content correct. In Picture 1, Compound Sequence W (Appendix A) the intended message is "Monsieur Thibaut est français". The received message, "Do you live in France?" has the wrong modality which, when corrected, becomes "You live in France". It also has the wrong direction, and, after correction, is "He lives in France". The pupil has the third person subject of the speech, a semantic equivalent of "is", and has recognized the blue outline as that of a country, so the content is considered correct.

Total message. This is the combination of the direction, modality, and content of the message conveyed by a picture. The subject is credited with the correct total message if his interpretation of the direction, modality, and content are correct.

Pictorial element. An element of this kind is a direct representation of an object, person or situation. It is the reproduction of what is actually seen in the world around, or created from the realm of the imagination. Examples of pictorial elements are trees, a rabbit, the

Eiffel Tower, a flower seller, and a book-stall scene on the left bank of the Seine.

Ideographeme. This is a graphic representation of a thought or idea. It can, for example, take the form of a balloon enclosing a person, object, situation, or symbol. It could be a person with distorted features, like a man with elongated arms (to indicate the extreme height of what he is pointing to).

Graphic symbol. A graphic sign used to convey a specific part of a message is a graphic symbol. It could, for example, be a question mark (to indicate a question) a cross (showing negation), or an arrow (to point the way).

Simple picture. The composition of a simple picture conforms to the structure of a real-life situation. Its format resembles a photograph in that it has solely pictorial representations. If there is a situational background, it may be vital to the message, but its importance must be indicated by "natural" means -- perhaps by a gesture, or facial expression.

Compound picture. The composition of this kind of picture is a combination of any two or three of these kinds of elements: pictorial, ideographemic, and graphic.

Sequence. This is a series of pictures having a situational unity and accompanied by appropriate linguistic units.

V. HYPOTHESES

The relative effectiveness of two kinds of pictures and two different ways of presenting them for interpretation are examined in order to answer questions about the meaning-conveying properties of pictures. The non-clarification treatment demands a shorter exposure to the visuals than the clarification treatment. To determine if the added exposure time influences the results the scores yielded by both treatments are compared. The three composite parts of the total message: direction, modality, and content are examined to determine any interrelationships, the value of the separate parts as predictors of the whole, and the extent to which the variance in the message can be attributed to each of the composite parts.

The hypotheses to be tested by the Two-way Analysis of Variance Method are grouped under Hypothesis I:

Hypothesis I

There is no significant relationship between the kind of picture, either simple or compound, and the treatment conditions, either non-clarification or clarification, under which they are observed with respect to the dimensions of:

- (A) Direction
- (B) Modality
- (C) Content
- (D) Message

The hypotheses to be tested by the One-way Analysis of Variance Method are grouped under Hypothesis II and Hypothesis III:

Hypothesis II

There is no significant difference between the total scores yielded by simple pictures exposed for observation for a non-extended period of time and those exposed for an extended period under the non-clarification treatment conditions with respect to the dimensions of:

- (A) Direction
- (B) Modality
- (C) Content
- (D) Message

Hypothesis III

There is no significant difference between the total scores yielded by compound pictures exposed for observation for a non-extended period of time and those exposed for an extended period under the non-clarification treatment conditions with respect to the dimensions of:

- (A) Direction
- (B) Modality
- (C) Content
- (D) Message

The hypotheses to be tested by the Stepwise Regression Analysis Method are grouped under Hypothesis IV:

Hypothesis IV

The prediction of message as based on the single most highly correlated predictor variable with the criterion is not significantly improved by the addition of further variables to the prediction equation for:

- (A) The simple pictures observed under the non-clarification treatment conditions.
- (B) The simple pictures observed under the clarification treatment conditions.
- (C) The compound pictures observed under the non-clarification treatment conditions.
- (D) The compound pictures observed under the clarification treatment conditions.

CHAPTER IV

DESIGN AND METHODOLOGY

I. THE SIMPLIFIED SCHEMA

In its basic form the experiment may be represented by the following diagram:

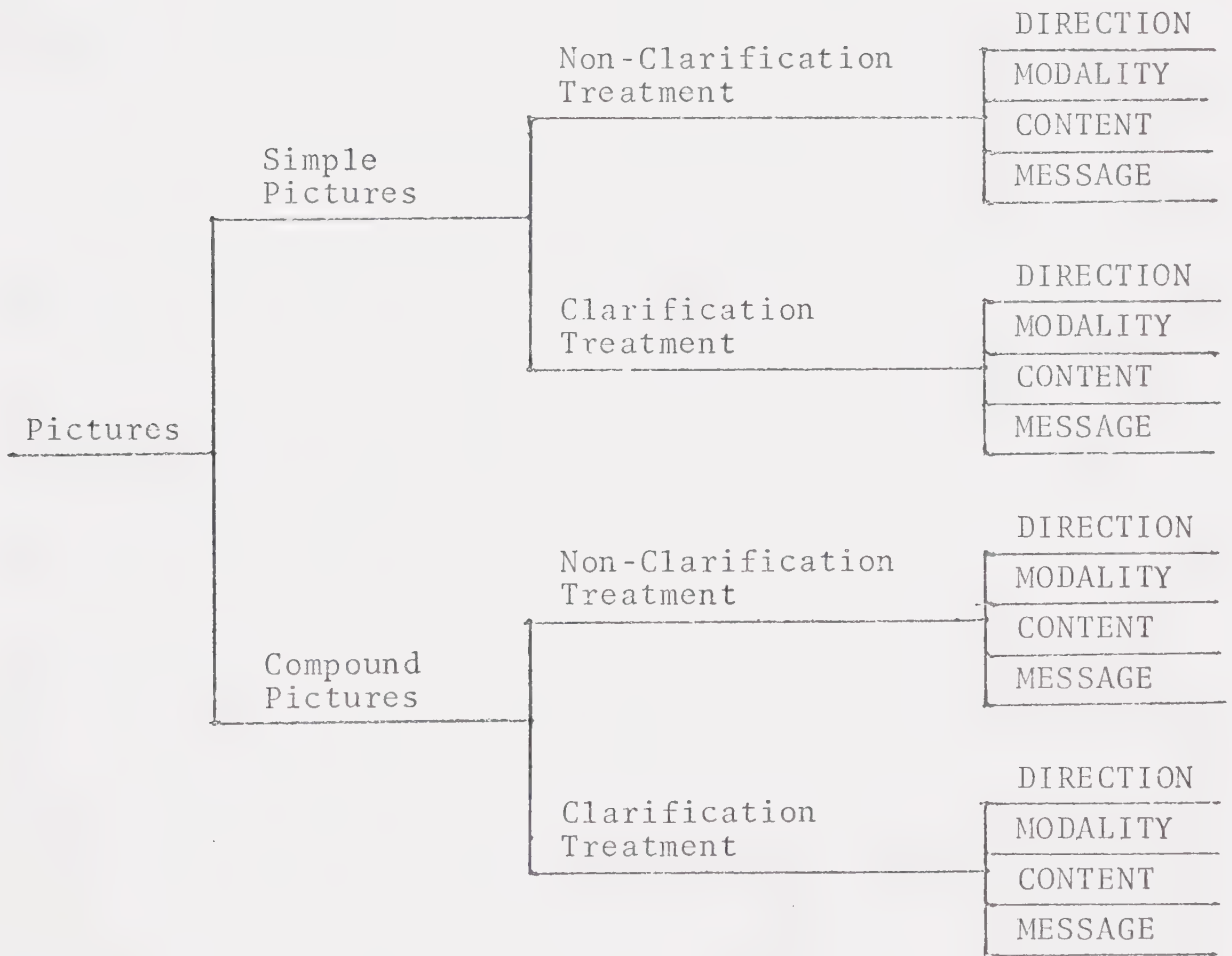


FIGURE 1

THE SCHEMA FOR THE EXPERIMENT

The sequences of pictures used for interpretation were divided into two categories according to their composition. They were classified as either simple or compound. Both categories were studied under two types of treatment conditions: non-clarification and clarification. The responses yielded by the different treatments were analyzed with respect to the criterion variables of direction, modality, content, and message.

II. POPULATION AND SAMPLE

Through the courtesy of the Edmonton Public School Board the investigator was provided with eight classes of grade six pupils from eight different schools. The classes were required to meet certain criteria so that as many of the causes of inequality among the groups could be as controlled as possible. No two classes had the same French teacher in grades five and six. All classes were heterogeneous in terms of academic performance and had begun Bonjour Line at the beginning of grade five. The schools to which the classes belonged were situated in similar social, ethnic, and socio-economic areas. The Edmonton Public School System has the policy of beginning Bonjour Line in grade five. Wherever favourable conditions exist, this policy is executed. The aim is to introduce pupils who have had two previous years of oral French to grade seven. The sample for this study was drawn from

pupils whose French experience at the end of grade six met the desired requirement of the school board. On entering grade seven, the pupils would have taken Bonjour Line for the previous two years.

III. INSTRUMENTATION

Eight sequences of five or six frames were taken from the first five lessons of Voix et Images de France (Appendix A). Samples were taken from this number of lessons because that is the suggested amount of the program to be covered in grade seven. Four of the sequences were composed of simple pictures only, i.e. those pictures with formats resembling photographs in that they have solely pictorial representations. The other four sequences were composed only of compound pictures, i.e. those pictures with compositions which are combinations of any two of the three elements: pictorial, ideographemic, and graphic. Wherever possible the sequences were chosen so that they had an equal number of frames. In both kinds of sequences three had six frames and one had five. The compound sequences were wholly composed of compound pictures except in the one instance where a sequence of six frames had to include one simple picture.

The Testing Equipment

The testing ensemble consisted of a tape recorder, a filmstrip projector with extended auto-loader, a projector

adapted to project slides with extended auto-loader, a screen, tapes for the two practice exercises and the test sequences, filmstrips of the practice exercises, transparent photographic slides of the test sequences, and answer sheets.

IV. THE EXPERIMENTAL DESIGN

Graphically, the design for the study may be represented by the following figure:

	NON-CLARIFICATION TREATMENT		CLARIFICATION TREATMENT	
SIMPLE PICTURES	1 DACB ↓ ↓	2 CDAB ↓ ↓	3 DACB	4 CDAB
COMPOUND PICTURES	5 ZXWY ↓ ↓	6 ZWXY ↓ ↓	7 ZXWY	8 ZWXY

FIGURE 2

THE DESIGN SIMPLIFIED

Each cell in the figure -- 1, 2, 3, etc. -- represents one class of twenty-two pupils. Two classes comprise each of the four principal conditions:

(1) The simple pictures interpreted under the non-clarification treatment conditions.

(2) The simple pictures interpreted under the clarification treatment conditions.

(3) The compound pictures interpreted under the non-clarification treatment conditions.

(4) The compound pictures interpreted under the clarification treatment conditions.

Each class was allocated to a cell by random draw.

The letters A, B, C, and D represent the sequences of simple pictures and the letters W, X, Y, and Z, the sequences of compound pictures.

The subjects in Cells 1 and 3 saw the sequences of pictures in a given order, as did the subjects in Cells 2 and 4, 5 and 7, and 6 and 8.

The arrows shown in Cells 1, 2, 5, and 6 indicate which sequences were presented for an extended period of time. These extended sequences were also decided by random draw.

From Figure 2 it can be seen how this class which drew Cell 2, for example, would be presented the Simple Sequences CDAB under the non-clarification treatment conditions, with the fourth and first sequences, D and A, being shown with extended time in the second and third places of the total presentation.

V. PROCEDURE AND ADMINISTRATION SCHEDULE

A pilot study was run two weeks prior to the actual experiment to examine the procedures under classroom conditions. A further practice session was held one day

before the actual schedule was due to begin to verify that the changes from step to step in the procedure had become more fluid. In the first pilot study minor faults were found in the wording of the clarification treatment, and a more serious deficiency was discovered. It was seen that the transition from sequence to sequence could be improved by rearranging the order of the sequences in the loading cartridge of the projector.

No preparation was needed for the classroom teachers or their classes.

To promote as great a degree of standardization as possible the treatments were registered on tape, and the same investigator controlled and administered all phases of the study. The four sequences for each group were presented at a single session. The whole treatment: the introduction, practice examples, and test exercises lasted approximately one hour. There was no preconceived schedule for the school visits and the appointments were made at the teachers' convenience on Tuesday, Wednesday, or Thursday. In this way the testing period lasted two school weeks during the month of April, 1970.

The Extended Time Factor

If the results of the experiment indicated a significant difference in performance between the groups under the non-clarification and clarification treatment conditions, it could be claimed that any such difference

might be due to the added time the pictures were exposed to the subjects under the clarification treatment conditions. The subjects having the clarification treatment were exposed to pictures for the same length of time as those having the non-clarification treatment plus the time necessary to make the clarification. In order to assure that it was the clarification treatment that caused any difference in performance and not the additional time this treatment required, each sequence was shown for an extended period under the non-clarification treatment conditions. At the time of analysis the performance under the non-clarification treatment conditions with the extended time factor could be compared with that under the non-clarification treatment conditions without the extended time factor. It could also be compared with the performance under the clarification treatment conditions to see if there were significant differences.

In order to equalize the exposure time of each sequence for both treatments, a simple calculation was done: the time needed for the clarification treatment was measured and divided by the number of pictures in the sequence. Each picture was then shown for the extra period of time determined in this manner. The following table shows the sequences, the length of time needed for each clarification treatment, the number of pictures in each sequence, and the added time necessary per picture to

compensate for the extra exposure time required under the clarification conditions.

Introduction and Practice Exercises

The investigator spent the first few minutes in the classroom introducing himself, speaking generally about the pending activity (Appendix D), and distributing the answer sheets (Appendix H). The practice exercises followed (Appendix E). Those for the non-clarification treatment group were composed of the same procedures as the test sequences which followed (Appendix F). Similarly, the procedures for the practice exercises for the clarification treatment group were identical to those for the test exercises which followed (Appendix F). The details of the clarification treatment of each sequence were different because specific elements had to be emphasized and every picture was composed of different elements (Appendix G).

TABLE I

TIME NECESSARY FOR THE CLARIFICATION TREATMENT

Sequence	Time for Clarification		Pictures per Sequence	Time per Picture
SIMPLE				
A	2 min	35 sec	6	26 sec
B	2	15	6	23
C	1	04	6	11
D	1	50	5	22
COMPOUND				
W	3 min	00 sec	6	30 sec
X	2	00	5	24
Y	2	24	6	24
Z	2	44	6	27

Procedure for the Non-clarification Treatment Conditions

The detailed description of this procedure is given in Appendix F.

(1) The first sequence was shown frame by frame at intervals of seven seconds.

(2) The first step was repeated.

(3) The initial picture of the sequence was presented and the subjects wrote their interpretation of it in the appropriate place on the answer sheets.

(4) The medial picture was treated as in the previous step.

(5) The final picture was treated in the same way.

The remaining sequences and pictures to be interpreted followed the procedure outlined.

Variation of Procedure for Pictures Given Extra Exposure Time

The detailed description of this variation is given in Appendix F.

The steps outlined above for the ordinary non-clarification treatment conditions held for this variation except that between the first and second steps an extra presentation was made allowing for the calculated extra exposure time.

Procedure for the Clarification Treatment Conditions

The detailed description of this procedure is

given in Appendix F.

This procedure was the same as for the ordinary non-clarification conditions outlined above except that between the first and second steps the clarification treatment was given.

VI. STATISTICAL ANALYSIS

Each subject's response to each picture presented for interpretation was analyzed with respect to direction, modality, content, and message. The frequencies of correct responses on each of these dimensions for each time the picture was presented were tabulated. In all, eight classes were involved in the study, four of which underwent the non-clarification treatment and four underwent the clarification treatment. Of the four classes which underwent the non-clarification treatment two were tested on simple pictures, and two were tested on compound pictures. The orders of presentation of the simple pictures, and the simple pictures which were shown for an extended period of time were different for both classes. The orders of presentation for the compound pictures under the same non-clarification treatment conditions and the compound pictures which were shown for an extended time were different for both classes. Of the four classes which underwent the clarification treatment two were tested on the simple pictures and two were tested on compound pictures. The

order of presentation of the simple pictures for one class which underwent the clarification treatment corresponded to the order for one of the classes which underwent the non-clarification treatment, and the order of presentation of the simple pictures for the other class which underwent the clarification treatment corresponded to the order for the other class which underwent the non-clarification treatment. The order of presentation of the compound pictures for one class which underwent the clarification treatment corresponded to the order for one of the classes which underwent the non-clarification treatment, and the order of presentation of the compound pictures for the other class which underwent the clarification treatment corresponded to the order for the other class which underwent the non-clarification treatment.

Accordingly, the appropriate frequency counts could be made for each class of students, for each picture, on each dimension. These frequency counts were the raw data which were analyzed by the different computer programs. Although the classes were of different sizes when the testing was done, they were equalized to prevent added complications in the analysis programs. The largest class numbered twenty-nine subjects and the smallest twenty-two, so every class was levelled to twenty-two. Everybody in each class was submitted to the appropriate study treatment but only twenty-two test papers were used for compiling the

frequency counts. The number of test responses in excess of twenty-two for each class were subtracted by random draw.

The validity of the choice of sequences, and of the analysis of the subjects' responses were established by two authorities. These people are professors actively engaged in teaching French by audio-visual methods at the University of Alberta.

The investigator's reliability in scoring the responses was checked by comparing the scoring of two authorities. One of the authorities is a professor lecturing in foreign language methods at the University of Alberta, and the other, at the same university, is a doctoral candidate whose major field of study is closely allied to the present study: the value of pictures as conveyers of meaning.

Each picture used in the experiment was assigned an identification number indicating the group of subjects to whom it was presented. There were eight separate groups. Another number was assigned to distinguish the sequence to which a picture belonged. There were four simple and four compound sequences. A third number was assigned to indicate the position a picture held within its own sequence. There were three positions. The total number of correct responses on the dimensions of direction, modality, content, and message, respectively, for each picture, and for each group, were punched onto IBM cards. These data were then analyzed

using programs supplied by the Division of Educational Research Services, Faculty of Education, University of Alberta for the university's IBM 360/67 computer. A listing of the scores yielded by the twenty-four pictures and 176 subjects is included in Appendix J.

The computer programs used for the analysis of the data in this study were the ANOV23 program, the ANOV14 program, the ANOV22 program, the ANOV25 program, the DEST02 program, and the MULR06 program. The ANOV23 program provides for a two-way analysis of variance with repeated measures on one factor and equal cell members.¹ This statistic affords an examination of the relationship between the kind of picture used in the study, and the sort of treatment conditions under which it was observed. The repeated measures are the pictures. The same pictures were examined under different conditions. The cell numbers are uniform at twenty-two. Among the output for this program are the cell sums of squares, the degrees of freedom, the mean cell sum of squares, and the F-ratios. The latter, the F-ratios, provide an estimation of the significance of the "A" factor effects, i.e. the kind of picture, the "B" factor effects, i.e. the kind of treatment, and their interaction.

¹B. J. Winer, Statistical Principles in Experimental Design (New York: McGraw-Hill Book Company, 1962), pp. 298-318.

The ANOV14 program provides for a one-way analysis of variance with repeated measures.² The factors under examination were two ways of presenting the same pictures for interpretation; thus, the repeated measures were the pictures. Each group of subjects did not view all the sequences of pictures under both the treatment conditions; therefore, the group could not act as its own control. However, this variation was not considered as sufficiently serious to negate any conclusions arising from the analysis. The sampling technique for determining the school classes to be used provided some assurance that the groups were comparable for the purposes of the investigation, and the homogeneity of variance test results indicated that this assurance was justified. This one-way analysis of variance program was applied on four occasions because four separate analyses were necessary: (1) the effect on interpretation of the non-extended and extended time allowed for observation of simple pictures under the non-clarification treatment conditions, (2) the effect on interpretation of the non-extended and extended time allowed for observation of compound pictures under the non-clarification treatment conditions, (3) the relationship of the extended time allowed for observation of the compound pictures under the non-clarification treatment conditions and the observation under the clarification treatment conditions of the same

²Ibid., pp. 105-132.

pictures, and (4) the relationship of the non-extended time allowed for observation of the compound pictures under the non-clarification treatment conditions and observation under the clarification treatment conditions of the same pictures. The output for this program includes the cell sums of squares, degrees of freedom, the mean cell sum of squares, and the F-ratio by which an estimation of the significance of the two treatment effects can be made.

The ANOV22 program provides for a two-way analysis of variance with unequal cell frequencies by means of a least squares solution.³ In this study the cell observations were equal but the ANOV22 program, although specially designed for unequal cell frequencies, was appropriate. Winer points out that the least squares analysis is a generally more powerful test for the sums of squares although computationally more difficult.⁴ The relationship between the order of presenting the pictures for interpretation and the sort of treatment conditions under which they were examined was investigated. The "A" factor had two levels of order, and the "B" factor comprised two levels of treatment: the non-clarification and clarification conditions. The output for this program includes the cell sums of squares, the degrees of freedom, the mean cell sum of squares, and the F-ratios by which an estimation can be

³Ibid., p. 291.

⁴Ibid., p. 224.

made of the significance of the "A" factor effect, the "B" factor effect, and any interaction.

The ANOV25 program provides for a two-way analysis of variance fixed-effects model with equal or unequal observations in each cell. In this investigation all the treatment levels about which inferences are to be drawn are included; therefore, the fixed-effects model of analysis is appropriate. There are equal observations in each cell; thus, the other criterion for the program is met. The program was employed to test the assumption of homogeneity of population-error variances although Kirk states that "The F distribution is robust with respect to violation of the assumption of homogeneity of population-error variances provided that the number of observations in the samples is equal."⁵ In this program the "A" and "B" factors correspond exactly with those of the previous analysis which examined the effect of order. The "A" factor comprised two levels of the order of presenting the pictures, and the "B" factor was composed of two levels of treatment: the non-clarification conditions, and the clarification conditions. Among the output for this program are the chi square statistic which permits an estimation of the significance of the assumption of homogeneity of variance.

⁵Roger E. Kirk, Experimental Design: Procedures for the Behavioral Sciences (Belmont, California: Wadsworth Publishing Company, 1968), p. 61.

The DEST02 program provides for the calculation and output of means, standard deviations, and a square symmetric matrix of Pearson product-moment correlations.⁶ This program was applied to the four major phases of the study: (1) the simple pictures observed under the non-clarification treatment conditions, (2) the simple pictures observed under the clarification treatment conditions, (3) the compound pictures observed under the non-clarification treatment conditions, and (4) the compound pictures observed under the clarification treatment conditions. The frequency counts for the dimensions of direction, modality, content, and message are quantitative; therefore, they are suitable values to be analyzed by the Pearson product-moment correlation coefficient procedure.

The MULRO6 program provides a stepwise regression analysis to determine which variables add most effectively to prediction.⁷ It provides the option of entering the predictor variables into the regression equation in stepwise order, in some pre-assigned order, or in a pre-assigned order for any number of variables and stepwise order for the rest. The generation of sums, products, powers, and other functions of the original variables are also possible, and

⁶G. A. Ferguson, Statistical Analysis in Psychology and Education (New York: McGraw-Hill Book Company, 1966), pp. 105-131.

⁷M. A. Efroymson, "Multiple Regression Analysis," Mathematical Methods for Digital Computers, A. Ralston and H. S. Wilf, editors (New York: John Wiley and Sons, 1960), pp. 191-203.

these functions may be entered into the prediction equation. In this experiment this analysis was used to determine which of the predictor variables of direction, modality, and content add most effectively to the prediction of message. The intermediate regression equations are attained by adding one variable at a time. The variable with the highest zero-order correlation is picked out first. The equations may be represented as:

$$Y = b_0^{(1)} + b_1^{(1)}X_1 + e^{(1)}$$

$$Y = b_0^{(2)} + b_1^{(2)}X_1 + b_2^{(2)}X_2 + e^{(2)}$$

$$Y = b_0^{(3)} + b_1^{(3)}X_1 + b_2^{(3)}X_2 + b_3^{(3)}X_3 + e^{(3)}$$

⋮
⋮
⋮

Where Y is the dependent or criterion variable, X_1, X_2, \dots are the independent or predictor variables, b_0, b_1, \dots are the coefficients which produce the best fit in the "least-squares" sense, and e is the error term, i.e. the difference between the predicted and the observed values of the dependent variables. The variable added at each step is the one making the greatest improvement in the "goodness of fit."⁸ That is to say that at each step the variable added is the one which accounts for the greatest proportion of the remaining variance of the dependent variable. The variable

⁸Ibid., pp. 191-192.

added produces the greatest reduction in the sum of the squared error terms. The output includes regression weights for the entering predictor variable, the per cent of variance accounted for by the entering predictor variables, the F-ratios of the variables entering, and the composite F-ratios. The F-ratios enable an estimation to be made of the statistical significance of the effect of the entering variables on the criterion.

This chapter has included a schema of the experiment, a description of the population, sample, and instrumentation. A diagram of the design has been presented and the procedure and administration schedule outlined. The statistical methods to be used in the analysis of the data have been summarized and discussed.

CHAPTER V

ANALYSIS OF DATA AND INTERPRETATION OF RESULTS

This chapter presents the analysis and interpretation of the observations and statistical data obtained from this investigation into the meaning-conveying qualities of two kinds of pictures under two kinds of treatment conditions. The data obtained from the test instruments were processed by the investigator, and statistical analyses were carried out by IBM computer programs from the Division of Educational Research Services at the University of Alberta. The statistical findings are presented in tabular form. For the purposes of this study it was decided to accept as statistically significant a probability level of 5 per cent.

This chapter reports:

(1) The results of the two-way analysis of variance used to examine the major hypothesis of the study.

(2) The results of the one-way analysis of variance used to examine the effect of exposure of the pictures for an extended time under the non-clarification treatment conditions.

(3) The results of the two-way analysis of variance used to study the effect of order of presentation of the materials.

(4) The chi square statistic used to establish the homogeneity of variance of the groups.

(5) The intercorrelations of the dimensions evaluated for the simple pictures under the non-clarification treatment conditions, the simple pictures under the clarification treatment conditions, the compound pictures under the non-clarification treatment conditions, and the compound pictures under the clarification treatment conditions.

(6) The degree to which the total message conveyed by the pictures is dependent upon its composite parts.

I. THE STATISTICAL TREATMENT OF THE DATA

Analysis of Variance: Pictures and Treatments

An analysis of variance design for repeated measures was used to test the following group of hypotheses:

Hypothesis I

There is no significant relationship between the kind of picture, either simple or compound, and the treatment conditions, either non-clarification or clarification, under which they are observed with respect to the dimensions of:

(A) Direction

(B) Modality

(C) Content

(D) Message

The analysis of variance was designed as a two by two factorial experiment with two levels of factor A, simple

and compound pictures, and two levels of factor B, non-clarification and clarification treatment conditions. The criterion or dependent variable was the total score yielded on each of the dimensions under scrutiny. There were four dimensions so four analyses were performed, and their results recorded, respectively, in Tables II, III, IV, and V.

For the treatment main effect the resulting F-ratios of 26.42, 61.38, and 52.35 for modality, content, and message, respectively, indicate that for these components of the total message itself, the treatment conditions is highly significant as a contributing factor to the variance. The F-ratio of 5.50 for direction shows that for this dimension the kind of picture is significant at the 5 per cent level of confidence but the nature of the treatment conditions is not. Neither on the total message nor on any of its other three components was the kind of picture seen as having a significant bearing on the results.

Analysis of Variance: Non-extended and Extended Time -- Simple and Compound Pictures

This analysis was carried out to establish that if the groups operating under the clarification treatment conditions performed significantly better, the reason would be the clarification treatment itself and not the greater period of time which was required. Because there were two kinds of pictures, simple and compound, two separate analyses had to be performed on the non-clarification group data.

TABLE II

ANALYSIS OF VARIANCE: PICTURES AND TREATMENTS
ON DIRECTION

Source	SS	DF	MS	F
Between Pictures	563.34	47		
A. Pictures	60.17	1	60.17	5.50*
Pictures within Treatments	503.17	46	10.94	
Within Pictures	120.00	48		
B. Treatments	4.17	1	4.17	1.72
AB. Interaction	4.17	1	4.17	1.72
B x Pictures within Treatments	111.67	46	2.43	

* $p < 0.05$

TABLE III

ANALYSIS OF VARIANCE: PICTURES AND TREATMENTS
ON MODALITY

Source	SS	DF	MS	F
Between Pictures	995.96	47		
A. Pictures	28.17	1	28.17	1.34
Pictures within Treatments	967.79	46	21.04	
Within Pictures	253.00	48		
B. Treatments	92.05	1	92.05	26.42*
AB. Interaction	0.66	1	0.66	0.19
B x Pictures within Treatments	160.30	46	3.49	

* $p < 0.01$

TABLE IV
ANALYSIS OF VARIANCE: PICTURES AND TREATMENTS
ON CONTENT

Source	SS	DF	MS	F
Between Pictures	2002.96	47		
A. Pictures	26.04	1	26.04	0.61
Pictures within Treatments	1976.92	46	42.98	
Within Pictures	948.00	48		
B. Treatments	541.51	1	541.51	61.38*
AB. Interaction	0.67	1	0.67	0.08
B x Pictures within Treatments	405.84	46	8.82	

* $p < 0.01$

TABLE V
ANALYSIS OF VARIANCE: PICTURES AND TREATMENTS
ON MESSAGE

Source	SS	DF	MS	F
Between Pictures	1625.41	47		
A. Pictures	0.84	1	0.84	0.02
Pictures within Treatments	1624.56	46	35.32	
Within Pictures	762.50	48		
B. Treatments	404.26	1	404.26	52.35*
AB. Interaction	3.02	1	3.02	0.39
B x Pictures within Treatments	355.23	46	7.72	

* $p < 0.01$

Analysis of variance was used to test each of the following groups of hypotheses:

Hypothesis II

There is no significant difference between the total scores yielded by simple pictures exposed for observation for a non-extended period of time and those exposed for an extended period under the non-clarification treatment conditions with respect to the dimensions of:

- (A) Direction
- (B) Modality
- (C) Content
- (D) Message

Hypothesis III

There is no significant difference between the total scores yielded by compound pictures exposed for observation for a non-extended period of time and those exposed for an extended period under the non-clarification treatment conditions with respect to the dimensions of:

- (A) Direction
- (B) Modality
- (C) Content
- (D) Message

Separate programs of one-way analysis of variance were performed for both the simple and compound pictures but the designs were identical. Two variables were under examination. The first was the total score from the sequences observed under the non-extended time treatment conditions; the second, the total score from the sequences

viewed under the extended time treatment conditions. For the simple sequences the non-extended units were D and A in Cell 1, and C and B in Cell 2, and the extended units were C and B in Cell 1, and D and A in Cell 2. For the compound sequences the non-extended units were Z and X in Cell 5, and W and Y in Cell 6, and the extended units were W and Y in Cell 5, and Z and X in Cell 6 (Figure 2, page 65). The criterion or dependent variable was the total score yielded on the dimensions under examination. Four analyses were carried out: one for each of the four dimensions. The results are recorded, respectively, in Tables VI, VII, VIII, and IX for the simple pictures, and in Tables X, XI, XII, and XIII for the compound pictures.

For the simple pictures the resulting F-ratios of 0.29, 1.85, 0.39, and 0.33 for direction, modality, content, and message, respectively, gave no reason to reject the null hypothesis. For the compound pictures the obtained F-ratios of 1.44, 2.43, 3.10, and 3.65 for direction, modality, content, and message, respectively, were not significant at the 5 per cent level of confidence. However, on the dimensions of content and message the F-ratios approached significance at the 10 per cent level of confidence. This was regarded as providing some justification for the examination of the possibility of significant differences between the effects of the extended time variation of the non-clarification treatment and the

TABLE VI

ANALYSIS OF VARIANCE: NON-EXTENDED AND EXTENDED TIME
SIMPLE PICTURES ON DIRECTION

Source	SS	DF	MS	F
Between Pictures	37.46	11	3.41	
Within Pictures	40.50	12	3.38	
Treatments	1.04	1	1.04	0.29
Residual	39.46	11	3.59	
Total	77.96	23		

TABLE VII

ANALYSIS OF VARIANCE: NON-EXTENDED AND EXTENDED TIME
SIMPLE PICTURES ON MODALITY

Source	SS	DF	MS	F
Between Pictures	303.33	11	27.58	
Within Pictures	140.00	12	11.67	
Treatments	20.17	1	20.17	1.85
Residual	119.83	11	10.89	
Total	443.34	23		

TABLE VIII

ANALYSIS OF VARIANCE: NON-EXTENDED AND EXTENDED TIME
SIMPLE PICTURES ON CONTENT

Source	SS	DF	MS	F
Between Pictures	586.83	11	53.35	
Within Pictures	123.00	12	10.25	
Treatments	4.17	1	4.17	0.39
Residual	118.83	11	10.80	
Total	709.83	23		

TABLE IX

ANALYSIS OF VARIANCE: NON-EXTENDED AND EXTENDED TIME
SIMPLE PICTURES ON MESSAGE

Source	SS	DF	MS	F
Between Pictures	555.00	11	50.45	
Within Pictures	141.00	12	11.75	
Treatments	4.17	1	4.17	0.33
Residual	136.83	11	12.44	
Total	696.00	23		

TABLE X

ANALYSIS OF VARIANCE: NON-EXTENDED AND EXTENDED TIME
COMPOUND PICTURES ON DIRECTION

Source	SS	DF	MS	F
Between Pictures	254.13	11	23.10	
Within Pictures	43.50	12	3.63	
Treatments	5.04	1	5.04	1.44
Residual	38.46	11	3.50	
Total	297.63	23		

TABLE XI

ANALYSIS OF VARIANCE: NON-EXTENDED AND EXTENDED TIME
COMPOUND PICTURES ON MODALITY

Source	SS	DF	MS	F
Between Pictures	206.84	11	18.80	
Within Pictures	59.00	12	4.92	
Treatments	10.67	1	10.67	2.43
Residual	48.33	11	4.39	
Total	265.84	23		

TABLE XII

ANALYSIS OF VARIANCE: NON-EXTENDED AND EXTENDED TIME
COMPOUND PICTURES ON CONTENT

Source	SS	DF	MS	F
Between Pictures	419.46	11	38.13	
Within Pictures	118.50	12	9.88	
Treatments	26.04	1	26.04	3.10
Residual	92.46	11	8.41	
Total	537.96	23		

TABLE XIII

ANALYSIS OF VARIANCE: NON-EXTENDED AND EXTENDED TIME
COMPOUND PICTURES ON MESSAGE

Source	SS	DF	MS	F
Between Pictures	270.33	11	24.58	
Within Pictures	113.00	12	9.42	
Treatments	28.17	1	28.17	3.65*
Residual	84.83	11	7.71	
Total	383.33	23		

* $p < 0.10$

non-extended time variation of the non-clarification treatment and the clarification treatment.

Analysis of Variance: Extended Time and Clarification Treatment - Compound Pictures

As was stated immediately above, it seemed possible that there could be a significant difference between the effects of the extended time treatment and the clarification treatment for compound pictures. Analysis of variance was used to examine this possibility in more detail. This analysis was designed so that three scores were compared. The first score consisted of the results of the compound pictures viewed for an extended time (Sequences W and Y in Cell 5, and Z and X in Cell 6, Figure 2, page 65), the second was the results of the compound pictures viewed by half of the total group that underwent the clarification treatment for compound pictures (Cell 7, Figure 2, page 65), and the third was the other half of this group (Cell 8). The total group was divided into halves because the analysis was based on a frequency count. It was necessary that each half-group being compared consist of the same number of subjects -- in this case, twenty-two. The criterion or dependent variable was the total score yielded on the dimensions under examination. The results of the four analyses, one for each dimension, are recorded in Tables XIV, XV, XVI, and XVII, respectively.

The obtained F-ratios of 8.41, 6.50, 12.98, and 9.61

TABLE XIV

ANALYSIS OF VARIANCE: EXTENDED TIME AND
CLARIFICATION TREATMENT - COMPOUND
PICTURES ON DIRECTION

Source	SS	DF	MS	F
Between Pictures	236.22	11	21.74	
Within Pictures	64.00	24	2.67	
Treatments	27.72	2	13.86	8.41*
Residual	36.28	22	1.65	
Total	300.22	35		

* $p < 0.01$

TABLE XV

ANALYSIS OF VARIANCE: EXTENDED TIME AND
CLARIFICATION TREATMENT - COMPOUND
PICTURES ON MODALITY

Source	SS	DF	MS	F
Between Pictures	204.66	11	18.61	
Within Pictures	97.34	24	4.06	
Treatments	36.16	2	18.08	6.50*
Residual	61.17	22	2.78	
Total	302.00	35		

* $p < 0.01$

TABLE XVI

ANALYSIS OF VARIANCE: EXTENDED TIME AND
CLARIFICATION TREATMENT - COMPOUND
PICTURES ON CONTENT

Source	SS	DF	MS	F
Between Pictures	374.75	11	34.07	
Within Pictures	278.00	24	11.58	
Treatments	150.50	2	75.25	12.98*
Residual	127.50	22	5.80	
Total	652.75	35		

* $p < 0.01$

TABLE XVII

ANALYSIS OF VARIANCE: EXTENDED TIME AND
CLARIFICATION TREATMENT - COMPOUND
PICTURES ON MESSAGE

Source	SS	DF	MS	F
Between Pictures	256.66	11	23.33	
Within Pictures	251.34	24	10.47	
Treatments	117.16	2	58.58	9.61*
Residual	134.17	22	6.10	
Total	508.00	35		

* $p < 0.01$

for direction, modality, content, and message, respectively, were found to be highly significant ($p < 0.01$) in all cases; therefore the null hypothesis was rejected.

Analysis of Variance: Non-extended Time and Clarification Treatment - Compound Pictures

To be more certain that the time of exposure to the visuals did not significantly influence performance, the results of the compound pictures exposed for a non-extended time were also compared with the results of the same pictures under the clarification treatment conditions. An analysis of variance was used in this investigation. The analysis was designed so that there were three values under scrutiny. The first was the total score from the four sequences of compound pictures exposed for a non-extended period (Sequences Z and X, Cell 5, and Sequences W and Y, Cell 6, Figure 2, page 65), and the second and third were the two smaller groups, respectively, which made up the complete compound-clarification group (Cells 7 and 8). This compound-clarification group was divided into halves because the analysis was based on a frequency count, requiring the same number of respondents in each half-group. In this case the number of subjects was again twenty-two because each half-group was based on one class of elementary school children, and the classes had been equalized to twenty-two subjects for the purposes of the experiment. The criterion or dependent variable was the total score yielded on the

dimensions under examination. Since there were four dimensions under examination four analyses were performed, and the results recorded respectively in Tables XVIII, XIX, XX, and XXI.

The calculated F-ratios of 6.99, 14.72, 32.74, and 37.54 for direction, modality, content, and message, respectively, were significant at less than the 1 per cent level of confidence. Since a highly significant difference between the non-extended non-clarification treatment conditions and clarification treatment conditions emerged, the null hypothesis was rejected.

An examination of the means of the three groups presented in Table XXII indicates quite clearly that the non-extended and extended time non-clarification treatment groups might be expected to be statistically significantly different from the clarification group for compound pictures. The F-ratios obtained by analysis of variance performed on the non-extended time versus the clarification treatment and the extended time treatment versus the clarification treatment are so high on all four dimensions that in no instance is the probability lower than the 0.006 level of confidence. It should be noted that the dimensions of content and message, with F-ratios approaching the 10 per cent level of confidence when the non-extended and extended treatments were compared, have F-ratios so high that the smaller of the two exceeds a probability level of 0.001 when

TABLE XVIII

ANALYSIS OF VARIANCE: NON-EXTENDED TIME AND
CLARIFICATION TREATMENT - COMPOUND PICTURES
ON DIRECTION

Source	SS	DF	MS	F
Between Pictures	293.64	11	21.79	
Within Pictures	71.34	24	2.97	
Treatments	27.72	2	13.86	6.99*
Residual	43.61	22	1.98	
Total	310.97	35		

* $p < 0.01$

TABLE XIX

ANALYSIS OF VARIANCE: NON-EXTENDED TIME AND
CLARIFICATION TREATMENT - COMPOUND PICTURES
ON MODALITY

Source	SS	DF	MS	F
Between Pictures	195.56	11	17.78	
Within Pictures	130.00	24	5.41	
Treatments	74.39	2	37.20	14.72*
Residual	55.61	22	2.53	
Total	325.56	35		

* $p < 0.01$

TABLE XX

ANALYSIS OF VARIANCE: NON-EXTENDED TIME AND
CLARIFICATION TREATMENT - COMPOUND PICTURES
ON CONTENT

Source	SS	DF	MS	F
Between Pictures	537.22	11	48.84	
Within Pictures	420.00	24	17.50	
Treatments	314.39	2	157.19	32.74*
Residual	105.61	22	4.80	
Total	957.22	35		

* $p < 0.01$

TABLE XXI

ANALYSIS OF VARIANCE: NON-EXTENDED TIME AND
CLARIFICATION TREATMENT - COMPOUND PICTURES
ON MESSAGE

Source	SS	DF	MS	F
Between Pictures	352.56	11	32.05	
Within Pictures	351.33	24	14.64	
Treatments	271.72	2	135.86	37.54*
Residual	79.61	22	3.62	
Total	703.89	35		

* $p < 0.01$

TABLE XXII

MEANS FOR THE NON-EXTENDED, EXTENDED, AND CLARIFICATION
TREATMENTS - COMPOUND PICTURES

A. DIRECTION

Means			
Non-Extended	Clarification 1	Clarification 2	F
18.17	17.58	19.67	6.99*
Extended			
19.08	17.58	19.67	8.41*

B. MODALITY

Means			
Non-Extended	Clarification 1	Clarification 2	F
16.25	17.67	19.75	14.72*
Extended			
17.58	17.67	19.75	6.50*

C. CONTENT

Means			
Non-Extended	Clarification 1	Clarification 2	F
7.75	12.58	14.83	32.74*
Extended			
9.83	12.58	14.83	12.98*

D. MESSAGE

Means			
Non-Extended	Clarification 1	Clarification 2	F
6.25	10.75	12.83	37.54*
Extended			
8.42	10.75	12.83	9.61*

* $p < 0.01$

each is compared individually with the clarification treatment group.

Analysis of Variance: Order and Treatment - Simple and Compound Pictures

The first hypothesis postulated that there was no significant relationship between the kind of picture and the treatment conditions under which it was examined. To investigate the possibility of the order of presentation influencing the results, an analysis of variance was again carried out.

Separate two-way analyses of variance were performed for the simple and compound pictures. The designs were identical, with two factors, each with two levels, under examination. The levels of factor A were the two ways of ordering the sequences, and the levels of factor B, the non-clarification and clarification treatments. For the simple pictures the ordering of Cells 1 and 3 was different from that of Cells 2 and 4; for the compound pictures Cells 5 and 7 were ordered differently from 6 and 8 (Figure 2, page 65). The criterion was the total score on the dimensions under scrutiny. Since again there were four dimensions under consideration, four analyses were executed, and the results recorded, respectively, in Tables XXIII, XXIV, XXV, and XXVI for the simple pictures, and in Tables XXVII, XXVIII, XXIX, and XXX for the compound pictures.

For the simple pictures on the order factor, the

TABLE XXIII

ANALYSIS OF VARIANCE: ORDER AND TREATMENT
SIMPLE PICTURES ON DIRECTION

Source	SS	DF	MS	F
A. Orders	21.33	1	21.33	7.32*
B. Treatments	8.33	1	8.33	2.86
AB. Interaction	10.08	1	10.08	3.46
Error	128.17	44	2.91	

* $p < 0.01$ Homogeneity of Variance Chi Square = 5.59 $p = 0.13$

TABLE XXIV

ANALYSIS OF VARIANCE: ORDER AND TREATMENT
SIMPLE PICTURES ON MODALITY

Source	SS	DF	MS	F
A. Orders	54.19	1	54.19	3.74*
B. Treatments	54.19	1	54.19	3.74*
AB. Interaction	13.02	1	13.02	0.90
Error	638.09	44	14.50	

* $p = 0.06$ Homogeneity of Variance Chi Square = 0.97 $p = 0.81$

TABLE XXV

ANALYSIS OF VARIANCE: ORDER AND TREATMENT
SIMPLE PICTURES ON CONTENT

Source	SS	DF	MS	F
A. Orders	8.33	1	8.33	0.26
B. Treatments	252.08	1	252.08	7.90*
AB. Interaction	85.33	1	85.33	2.67
Error	1404.17	44	31.91	

* $p < 0.01$ Homogeneity of Variance Chi Square = 1.74 $p = 0.63$

TABLE XXVI

ANALYSIS OF VARIANCE: ORDER AND TREATMENT
SIMPLE PICTURES ON MESSAGE

Source	SS	DF	MS	F
A. Orders	30.08	1	30.08	1.07
B. Treatments	168.75	1	168.75	6.01*
AB. Interaction	70.08	1	70.08	2.49
Error	1236.33	44	28.10	

* $p < 0.05$ Homogeneity of Variance Chi Square = 2.18 $p = 0.54$

TABLE XXVII

ANALYSIS OF VARIANCE: ORDER AND TREATMENT
COMPOUND PICTURES ON DIRECTION

Source	SS	DF	MS	F
A. Orders	47.99	1	47.99	5.19*
B. Treatments	0.00	1	0.00	0.00
AB. Interaction	0.08	1	0.08	0.01
Error	417.17	44	9.25	

* $p < 0.05$ Homogeneity of Variance Chi Square = 3.83 $p = 0.28$

TABLE XXVIII

ANALYSIS OF VARIANCE: ORDER AND TREATMENT
COMPOUND PICTURES ON MODALITY

Source	SS	DF	MS	F
A. Orders	50.02	1	50.02	5.91*
B. Treatments	38.52	1	38.52	4.55*
AB. Interaction	0.02	1	0.02	0.00
Error	372.75	44	8.47	

* $p < 0.05$ Homogeneity of Variance Chi Square = 2.14 $p = 0.54$

TABLE XXIX

ANALYSIS OF VARIANCE: ORDER AND TREATMENT
COMPOUND PICTURES ON CONTENT

Source	SS	DF	MS	F
A. Orders	65.33	1	65.33	3.51
B. Treatments	290.08	1	290.08	15.58*
AB. Interaction	0.08	1	0.08	0.00
Error	819.50	44	18.63	

* $p < 0.01$ Homogeneity of Variance Chi Square = 1.69 $p = 0.64$

TABLE XXX

ANALYSIS OF VARIANCE: ORDER AND TREATMENT
COMPOUND PICTURES ON MESSAGE

Source	SS	DF	MS	F
A. Orders	72.52	1	72.52	5.61*
B. Treatments	238.52	1	238.52	18.44**
AB. Interaction	1.69	1	1.69	0.13
Error	569.09	44	12.93	

* $p < 0.05$ ** $p < 0.01$ Homogeneity of Variance Chi Square = 1.08 $p = 0.78$

F-ratios of 3.74, 0.26, and 1.07 for the dimensions of modality, content, and message, respectively, indicate that order is not a significant factor at the 5 per cent level of confidence in accounting for variability of performance. However, the F-ratio of 7.32 for direction suggests that order bears a highly significant relationship to performance on this dimension. An examination of the F-ratios of the treatment factor shows that on the dimension of content ($F=7.90$) the F is highly significant at less than the 1 per cent level of probability, and on the dimension of message ($F=6.01$) the F is significant at less than the 5 per cent level of confidence. The treatment is not significant on the dimensions of direction and modality where the F-ratios are 2.86 and 3.74, respectively. The effect of the interaction between order and treatment is not significant on any of the dimensions.

For the compound pictures order was found to have a significant effect on performance on three dimensions out of four. The F-ratios of 5.19, 5.91, and 5.61 for direction, modality, and message, respectively, indicate that the effect of order of presentation of the sequences is statistically significant. The F-ratio of 3.51 for content is not significant according to the standards established for statistical purposes for this study, but it approaches the 5 per cent level of confidence. The effect of the treatment is highly significant for content and message, with

F-ratios 15.58 and 18.44, respectively, and significant for modality ($F=4.55$). However, for the dimension of direction, the F-ratio of 0.00 indicates that the treatment conditions is not significant. The extremely low values of the F-ratios of the interaction factor, 0.01, 0.00, 0.00, and 0.13 for direction, modality, content, and message, respectively, show that there is negligible interaction among the order of presentation of the sequences and the treatment conditions.

Analysis of Variance: Homogeneity of Variance -- Simple and Compound Pictures

Two major assumptions underlying the F statistic as calculated in the analysis of variance procedures are: (1) the distribution of the variables in the population from which the samples are drawn are normal, and (2) the variances in the population from which the samples are drawn are equal.¹ In order to ascertain if the assumptions were met by the data gathered in this investigation, suitable analyses were performed. Because no suitable procedure was available to test the assumption of homogeneity of variance, in the "repeated measures" situation, the validity of this assumption could not be established for the main hypothesis of:

¹George A. Ferguson, Statistical Analysis in Psychology and Education (New York: McGraw-Hill Book Company, 1966), p. 294.

There is no significant relationship between the kind of picture, either simple or compound, and the treatment conditions, either non-clarification or clarification, under which they are observed with respect to the dimensions of:

(A) Direction

(B) Modality

(C) Content

(D) Message

However, as was mentioned in the previous chapter, Kirk maintains that providing that the number of observations in the samples is equal, even if the assumption of homogeneity of population-error variances is violated, the F distribution is robust.² The factorial design for the analysis of variance which included the test for homogeneity of variance was used to study the effect of order and treatment. The chi square test for homogeneity of variance and its probability were computed separately for each dimension for the simple and compound pictures, and reported at the foot of the appropriate order and treatment table (Tables XXIII to XXX).

The resulting chi square values indicate that homogeneity of variance for the dimensions under examination is present in the data for both the simple and compound pictures throughout the groups of subjects. It is interesting

²Roger E. Kirk, Experimental Design: Procedures for the Behavioral Sciences (Belmont, California: Wadsworth Publishing Company, 1968), p. 61.

to note that the highest values for chi square, 5.59 for simple pictures and 3.83 for compound, occur on the dimension of direction, but these values are not significant at the 5 per cent level of confidence.

Relationships Between the Dimensions

Intercorrelations between the dimensions of direction, modality, content, and message were calculated using the Pearson product-moment correlation procedure for each of the groups: simple non-clarification, simple clarification, compound non-clarification, and compound clarification, and reported in Tables XXXI, XXXII, XXXIII, and XXXIV, respectively.

An examination of the tables reveals that the correlation coefficients of .71 and .68 for the simple non-clarification and simple-clarification groups, respectively, on the dimensions of modality and message are highly significant ($p < 0.01$). The correlation coefficients between the same dimensions for the compound non-clarification and compound clarification groups of .43 and .44, respectively, are significant at the 5 per cent level of confidence. The correlation coefficients of .71 and .64 for modality and content, respectively, for the simple non-clarification and simple clarification groups are highly significant ($p < 0.01$). Direction and modality are significantly correlated ($p < 0.05$) with a coefficient of .41 for the compound non-clarification group. The correlation

TABLE XXXI

CORRELATION MATRIX OF THE DIMENSIONS OF DIRECTION,
MODALITY, CONTENT, AND MESSAGE FOR SIMPLE PICTURES
UNDER NON-CLARIFICATION TREATMENT CONDITIONS

Dimensions	Direction	Modality	Content	Message
Direction	1.00			
Modality	.10	1.00		
Content	.19	.71*	1.00	
Message	.26	.71*	.95*	1.00
Mean	19.8	15.7	7.9	7.5
Standard Deviation	1.8	4.4	5.6	5.5

* $p < 0.01$

TABLE XXXII

CORRELATION MATRIX OF THE DIMENSIONS OF DIRECTION,
MODALITY, CONTENT, AND MESSAGE FOR SIMPLE PICTURES
UNDER CLARIFICATION TREATMENT CONDITIONS

Dimensions	Direction	Modality	Content	Message
Direction	1.00			
Modality	-.07	1.00		
Content	.13	.64*	1.00	
Message	.20	.68*	.93*	1.00
Mean	20.6	17.8	12.5	11.3
Standard Deviation	1.9	3.4	5.9	5.3

* $p < 0.01$

TABLE XXXIII

CORRELATION MATRIX OF THE DIMENSIONS OF DIRECTION,
MODALITY, CONTENT, AND MESSAGE FOR COMPOUND
PICTURES UNDER NON-CLARIFICATION TREATMENT
CONDITIONS

Dimensions	Direction	Modality	Content	Message
Direction	1.00			
Modality	.41*	1.00		
Content	-.24	.22	1.00	
Message	-.05	.43*	.84**	1.00
Mean	18.6	16.9	8.8	7.3
Standard Deviation	3.6	3.4	4.8	4.1

* $p < 0.05$

** $p < 0.01$

TABLE XXXIV

CORRELATION MATRIX OF THE DIMENSIONS OF DIRECTION,
MODALITY, CONTENT, AND MESSAGE FOR COMPOUND
PICTURES UNDER CLARIFICATION TREATMENT
CONDITIONS

Dimensions	Direction	Modality	Content	Message
Direction	1.00			
Modality	.11	1.00		
Content	-.30	.14	1.00	
Message	.02	.44*	.75**	1.00
Mean	18.6	18.7	13.7	11.8
Standard Deviation	2.6	2.6	3.9	3.4

* $p < 0.05$

** $p < 0.01$

coefficient between content and message is highly significant in all cases. The correlation coefficients between these two dimensions for simple non-clarification, simple clarification, compound non-clarification, and compound clarification groups, respectively, are .95, .93, .84, and .75. Thus, for the purposes of prediction, the only variable that may be confidently utilized as a predictor of the message is probably content. In the simple non-clarification group it can be seen that content accounts for 90 per cent of the message variance; in the simple clarification group it accounts for 86 per cent of the message variance; in the compound non-clarification group it accounts for 71 per cent of the message variance, and in the compound clarification group it accounts for 56 per cent of the message variance. For the simple non-clarification and simple clarification groups the dimension of content could be expected to be a good indicator of the total message. It could also have predictive value for the message for the compound non-clarification and compound clarification groups but not perhaps to the same extent. The dimensions as established in the study are highly intercorrelated suggesting that they are not independent. In order to arrive at more accurate knowledge of the function of the dimensions as predictors of the message, a stepwise regression analysis was performed on the basis of the above results.

Stepwise Regression Analysis

Because the criterion variable message is not independent of the three predictor variables, direction, modality, and content (the message was accounted correct if the correct responses were given for direction, modality, and content), the interpretation of the stepwise regression analysis must be viewed with caution. The prediction of the achievement on message was attempted using the three predictors, for which the designations in the stepwise regression analysis appear in Table XXXV below:

TABLE XXXV

THE DESIGNATIONS OF THE VARIABLES FOR THE STEPWISE
REGRESSION ANALYSIS

X_1	-	DIRECTION
X_2	-	MODALITY
X_3	-	CONTENT
X_4	-	MESSAGE

The following four hypotheses were tested with this type of analysis.

Stepwise Regression Analysis: Prediction of the Message -- Simple Pictures Under the Non-clarification Treatment Conditions

Hypothesis IV (A)

For the simple pictures observed under the non-clarification treatment conditions, the

prediction of message as based on the single most highly correlated predictor variable with the criterion is not significantly improved by the addition of further variables to the prediction equation.

The results of the statistical test of this hypothesis and the best fitting equation are presented in Table XXXVI. This equation includes the sole predictor variable which was found to have a statistically significant effect on the criterion. The dimension of content with a highly significant ($p < 0.01$) F-ratio of 2381.0 was found to account for 99.6 per cent of the message variance. No other predictor variable was found to make a significant contribution to the score on the message. Therefore, the null hypothesis was upheld.

Stepwise Regression Analysis: Prediction of the Message --
Simple Pictures Under the Clarification Treatment
Conditions

Hypothesis IV (B)

For the simple pictures observed under the clarification treatment conditions, the prediction of message as based on the single most highly correlated predictor variable with the criterion is not significantly improved by the addition of further variables to the prediction equation.

The results of the statistical test of this hypothesis and the best fitting equation are presented in Table XXXVI. This equation includes the sole predictor variable which has a statistically significant effect on the criterion. The dimension of content with a highly

TABLE XXXVI
STEPWISE REGRESSION ANALYSIS: PREDICTION OF MESSAGE DIMENSION COEFFICIENTS
FROM DIRECTION, MODALITY, AND CONTENT COEFFICIENTS FOR SIMPLE PICTURES
FOR THE NON-CLARIFICATION AND CLARIFICATION TREATMENTS CONDITIONS

Group	Computer Weights and Predictor Variables	Per Cent of Variance Accounted for	F-Ratio for Variable Entering	Composite F-Ratio
Standard Weights				
Simple Non- Clarification	$X_4 = 1.00X_3$	99.6	2381.0*	2381.0*
	Weights			
	$X_4 = .97X_3 - 0.37$			
Standard Weights				
Simple Clarification	$X_4 = .98X_3$	96.0	240.7*	240.7*
	Weights			
	$X_4 = .90X_3 + 0.04$			

* p < 0.01

significant F-ratio of 240.7 ($p < 0.01$) was found to account for 96 per cent of the message variance. Since no other predictor variable was found to have a significant effect on the score of the message, the null hypothesis was upheld.

Stepwise Regression Analysis: Prediction of the Message --
Compound Pictures Under the Non-clarification Treatment
Conditions

Hypothesis IV (C)

For the compound pictures observed under the non-clarification treatment conditions, the prediction of message as based on the single most highly correlated predictor variable with the criterion is not significantly improved by the addition of further variables to the prediction equation.

The results of the test of this hypothesis and the best fitting equation are presented in Table XXXVII. This equation includes the predictor variables which have a statistically significant effect on the criterion variance. The dimension of content with a highly significant F-ratio of 31.3 ($p < 0.01$) was found to account for 75.8 per cent of the message variance. This predictor variable together with modality with an F-ratio of 4.5 ($p < 0.10$) accounted for 83.9 per cent of the criterion variance. Although it can be seen that modality accounted for 8.1 per cent of the variance on the message for this group, the statistical null hypothesis was upheld on the grounds that the 5 per cent level of confidence was not attained.

TABLE XXXVII
STEPWISE REGRESSION ANALYSIS: PREDICTION OF MESSAGE DIMENSION COEFFICIENTS
FROM DIRECTION, MODALITY, AND CONTENT COEFFICIENTS FOR COMPOUND PICTURES
FOR THE NON-CLARIFICATION TREATMENT CONDITIONS

Group	Computer Weights and Predictor Variables	Per Cent of Variance Accounted for	F-Ratio for Variable Entering	Composite F-Ratio
Compound Non- Clarification	Standard Weights			
	$X_4 = .87X_3$	75.8	31.3*	31.3*
	Weights			
	$X_4 = .70X_3 + 2.38$			
	Standard Weights			
	$X_4 = .29X_2 + .85X_3$	83.9	4.5 ($p < 0.10$)	23.4*
	Weights			
	$X_4 = .33X_2 + .68X_3 - 8.3$			

* $p < 0.05$

Stepwise Regression Analysis: Prediction of the Message --
Compound Pictures Under the Clarification Treatment
Conditions

Hypothesis IV (D)

For the compound pictures observed under the clarification treatment conditions, the prediction of message as based on the single most highly correlated prediction variable with the criterion is not significantly improved by the addition of further variables to the prediction equation.

The results of the test of this hypothesis and the best fitting equation are presented in Table XXXVIII. This equation includes the predictor variables which have a statistically significant effect on the criterion. The dimension of content with a highly significant F-ratio of 14.6 ($p < 0.01$) was found to account for 59.3 per cent of the message variance when it acted alone as the predictor variable. This variable, when used in conjunction with modality, with an F-ratio of 4.0 ($p < 0.10$) accounted for 71.9 per cent of the message variance. These two predictor variables, content and modality, together with direction with an F-ratio of 7.4 ($p < 0.05$) accounted for 85.4 per cent of the message variance. From these results it is apparent that an anomaly has emerged. The predictor variable modality which entered at Step 2 and accounted for 12.6 per cent of the message variance is less significant than direction which entered at Step 3 and accounted for 13.5 per cent of the message variance. This phenomenon is probably caused by the effect of a suppressor

TABLE XXXVIII
STEPWISE REGRESSION ANALYSIS: PREDICTION OF MESSAGE DIMENSION COEFFICIENTS
FROM DIRECTION, MODALITY, AND CONTENT COEFFICIENTS FOR COMPOUND PICTURES
FOR THE CLARIFICATION TREATMENT CONDITIONS

Group	Computer Weights and Predictor Variables	Per Cent of Variance Accounted for	F-Ratio for Variable Entering	Composite F-Ratio
Compound Clarification	Standard Weights $X_4 = .77X_3$	59.3	14.6**	14.6**
	Weights $X_4 = .65X_3 + 5.8$			
	Standard Weights $X_4 = .36X_2 + .76X_3$	71.9	4.0 ($p < 0.10$)	11.5**
	Weights $X_4 = .45X_2 + .64X_3 - 10.8$			
	Standard Weights $X_4 = .45X_1 + .38X_2 + 1.01X_3$			
	Weights $X_4 = .58X_1 + .49X_2 + .85X_3 - 39.5$			
		85.4	7.4*	15.7**

* $p < 0.05$
** $p < 0.01$

variable.³ One predictor variable alone may have a different influence on the criterion than it has when acting in conjunction with other predictors because of its high correlation with other predictors and low correlation with the criterion. The full effect of a predictor may thus be suppressed by the presence of another predictor variable.

³Frederic M. Lord and Melvin R. Novick, Statistical Theories of Mental Test Scores (Reading, Massachusetts: Addison-Wesley Publishing Company, 1968), pp. 271-3.

CHAPTER VI

DISCUSSION AND IMPLICATIONS

I. SUMMARY

The problem of adapting commercially produced teaching programs to the teacher's own needs has always been present. In recent years more and more programs have been placed on the market, all of them incorporating their own suggested, and even prescriptive, methods. The methods vary and the prescriptions of one very often disagree strongly with those of another. It becomes increasingly necessary for the teacher to probe his own philosophy of teaching, to know the precise need of his class, and to realize that adaptations may have to be made of prepared teaching materials.

Voix et Images de France is a French program produced in France for beginning language learners. Its methodology is new and radically different from many other programs of French instruction. Its contents were tailored to fit the needs of French immigrants of the late teens and early adult age level. The program uses as its basis pictures in filmstrips which must be interpreted correctly by the student if the course is to be successful. This study was designed to explore some of the suspected problem areas that this kind of program may hold for children in a North American school system who are commencing junior high

school having completed two years of an audio-visual program in French which is similar in methodology.

A sample of ten grade six classes, two of which constituted a pilot study, were used in the total study during April of 1970. Of the eight remaining classes two each were randomly assigned to the four different experimental conditions. Thus, two different classes were exposed to simple pictures under the non-clarification treatment conditions, simple pictures under the clarification treatment conditions, compound pictures under the non-clarification treatment conditions, and compound pictures under the clarification treatment conditions. Eight sequences of pictures, with approximately six pictures in each, were chosen from the first five lessons of Voix et Images de France. The choice was supported by two authorities familiar with this program. Two kinds of sequences were chosen: (1) those composed of simple pictures only, and (2) those made up solely of compound pictures. Simple pictures were pictures which resembled photographs in their composition in that they were composed of pictorial elements only. Compound pictures, on the other hand, were pictures which were composed of a combination of any two or three of these kinds of elements: pictorial, graphic, and ideographic. Four simple sequences and four compound sequences were selected. The sequences were presented for interpretation to the different classes of grade six pupils

under two different kinds of conditions. The order of presentation of the sequences was assigned by random draw, as was the order of the sequences to be viewed for an extended period of time under the non-clarification treatment conditions. Under the non-clarification treatment conditions the pupils viewed each sequence frame by frame and then wrote their interpretations of the chosen pictures. Under the clarification treatment conditions the same pictures were viewed accompanied by a taped clarification in the pupils' native language. This commentary was designed to direct the pupils' attention to any obscure portion of the pictures, and to those pictorial details which were essential to the correct interpretation so that a more complete interpretation would result. Three pictures from each sequence: the initial, a medial, and the final were exposed in turn for interpretation after the clarification had been performed. The interpretations were analyzed with respect to four dimensions of the total message, namely direction, modality, content, and message. Two authorities substantiated the analysis by reading the author's definitions of the terms and checking a sample of the responses. As a further control the author rechecked his own analysis one month later.

As was stated above, each subject's response to each picture presented for interpretation was analyzed with respect to direction, modality, content, and message. For

direction the subject had to recognize who was speaking, and to what feature inside or outside the picture the speech was directed. Modality was the social rapport established in the message. It could be either assertion, request, question, or greeting and social situation response. The content of the message had two basic components: topic and comment. If a subject successfully interpreted the direction, modality, and content of the intended message, he was credited with the correct message. The frequencies of the correct responses on each of these dimensions for the different phases of the study were tabulated. These frequency counts were the raw data to be analyzed by the different programs. To prevent added computational complications twenty-two answer sheets were taken for each class of students and the frequency counts for that class compiled from them.

Several programs were used for the different analyses of data. A two-way analysis of variance with repeated measures on one factor and equal cell numbers was utilized to examine the relationship between the kinds of picture used in the study and the sort of treatment conditions under which they were observed. A one-way analysis of variance with repeated measures examined the relative importance of two ways of presenting the same pictures for interpretation under the non-clarification treatment conditions. The first analysis of this kind was

carried out with the pictures observed under the non-clarification treatment conditions. The effect of two variations of the time the pictures were exposed before interpretation was investigated. The findings from this analysis suggested a further investigation of the compound pictures observed for the two different times under the non-clarification treatment conditions, and the same pictures observed under the clarification treatment conditions. A two-way analysis of variance with unequal cell frequencies determined, by means of a least squares solution, the relationship between the order of presentation of the pictures for interpretation and the sort of treatment conditions under which the pictures were examined. In order to test the assumption of homogeneity of population-error variances, a two-way analysis of variance fixed-effects model with equal observations in each cell was utilized. The Pearson product-moment correlations calculation showed the interrelationships of the four dimensions in each of the four major phases of the study, namely the simple pictures observed under the non-clarification treatment conditions, the simple pictures observed under the clarification treatment conditions, the compound pictures observed under the non-clarification treatment conditions, and the compound pictures observed under the clarification treatment conditions. The results of these calculations indicated that an attempt should be made to determine which

of the predictor variables, direction, modality, and content, had a statistically significant effect on the prediction of the criterion variable message. A stepwise regression analysis was used to determine which variables added most effectively to prediction.

II. THE AIMS OF THE STUDY

The principal aim of this investigation was to examine the relationship between two types of pictures and two ways of presenting them for interpretation. There were also several important related issues to be investigated. Two ways of presenting the pictures with the non-clarification treatment were examined to determine if the added exposure time of the picture necessary in the clarification treatment was responsible for differences in performance and not the actual clarification treatment itself. Because the compound pictures yielded differences in performance approaching the 10 per cent level of significance on the dimensions of modality, content, and message between the sequences exposed for a non-extended time and those exposed for an extended time, further analyses were performed. The purposes here were to determine if the scores yielded by the extended and non-extended compound sequences under the non-clarification treatment conditions differed significantly from the scores of the same sequences observed under the clarification treatment conditions. The

sequences were presented in two different orders under both the study conditions, and an analysis was performed to determine if the order of presentation caused significant differences in scores. The chi square test for homogeneity of variance was performed wherever possible in order to assess the extent to which the data met this assumption underlying the F statistic. Another objective involved the examination of the intercorrelations of the dimensions in the four main phases of the study and, further to this, the investigation of the function of each of the dimensions as predictors of the total message.

III. DISCUSSION

The chi square test for homogeneity of variance indicated that there were no significant differences in the way each of the variables of direction, modality, content, and message were distributed within the experimental conditions. This result permits some degree of confidence when the results of the various analyses of variance are interpreted. However, there is one outcome which demands that some circumspection be exercised when conclusions have to be drawn: the order of presentation of the pictorial sequences was found to influence performance.

The Relationship Between the Order of Presentation of the Sequences and Performance

In the sequences composed of simple pictures order

was found to have a significant effect on the scores on the dimension of direction. This effect was highly significant. On examining the pictorial content of the sequences, it seems difficult to account for this influence. Simple Sequences B, C, and D (Appendix A) contain the same person Françoise but she is in a different room in her apartment in each instance. In Simple Sequences B and C she is wearing the same apron and showing her friend Jeannette around the apartment. This situation is clearly shown in Simple Sequence B where Jeannette is accompanying Françoise from the hall to the dining room and into the kitchen. In Simple Sequence C Jeannette does not appear at all and Françoise is shown in only one frame of the six. If Simple Sequence B had been presented before Simple Sequence C, it would have been expected that knowledge of the context of Simple Sequence B would have helped in the interpretation of C, but in neither of the two ways of ordering the material did B precede C.

In the compound sequences the effects of order on the test scores were considerably more apparent. This factor was found to have a significant influence on the dimensions of direction, modality, and message, and an effect approaching significance at the 5 per cent level of confidence on content. An examination of Figure 2 (page 65) shows that the different orders of presentation of the sequences differ in a minimal way. The first and final

sequences correspond; it is the order of the medial two sequences which differs. The illustrated content of the sequences sheds no light on why one particular order of viewing should yield better interpretive results than another. All four sequences take place in different locations and the characters appearing together throughout any one sequence are different from those in any other.

An examination of the frequency counts on the four dimensions for both simple and compound pictures offers some explanation for the influence of order. The two-way analysis of variance testing the effect of order and treatment takes into account the dispersion as well as the means of the different experimental groups. The results of the analysis of variance showed that order was a significant factor on several dimensions.

Figure 3 shows the frequency counts for the simple sequences on the dimensions of direction, modality, content, and message. It is not necessary to show the means for these frequencies because the cells representing the classes in the experimental design are equal with twenty-two subjects each (Figure 2, page 65). Plots of total frequencies or means may be regarded as presenting a somewhat misleading picture of the differences between the group as the dispersion of the scores around the mean is ignored. It can be seen that the two classes subjected to Order 2 achieved better on all dimensions. Figure 4 shows the same

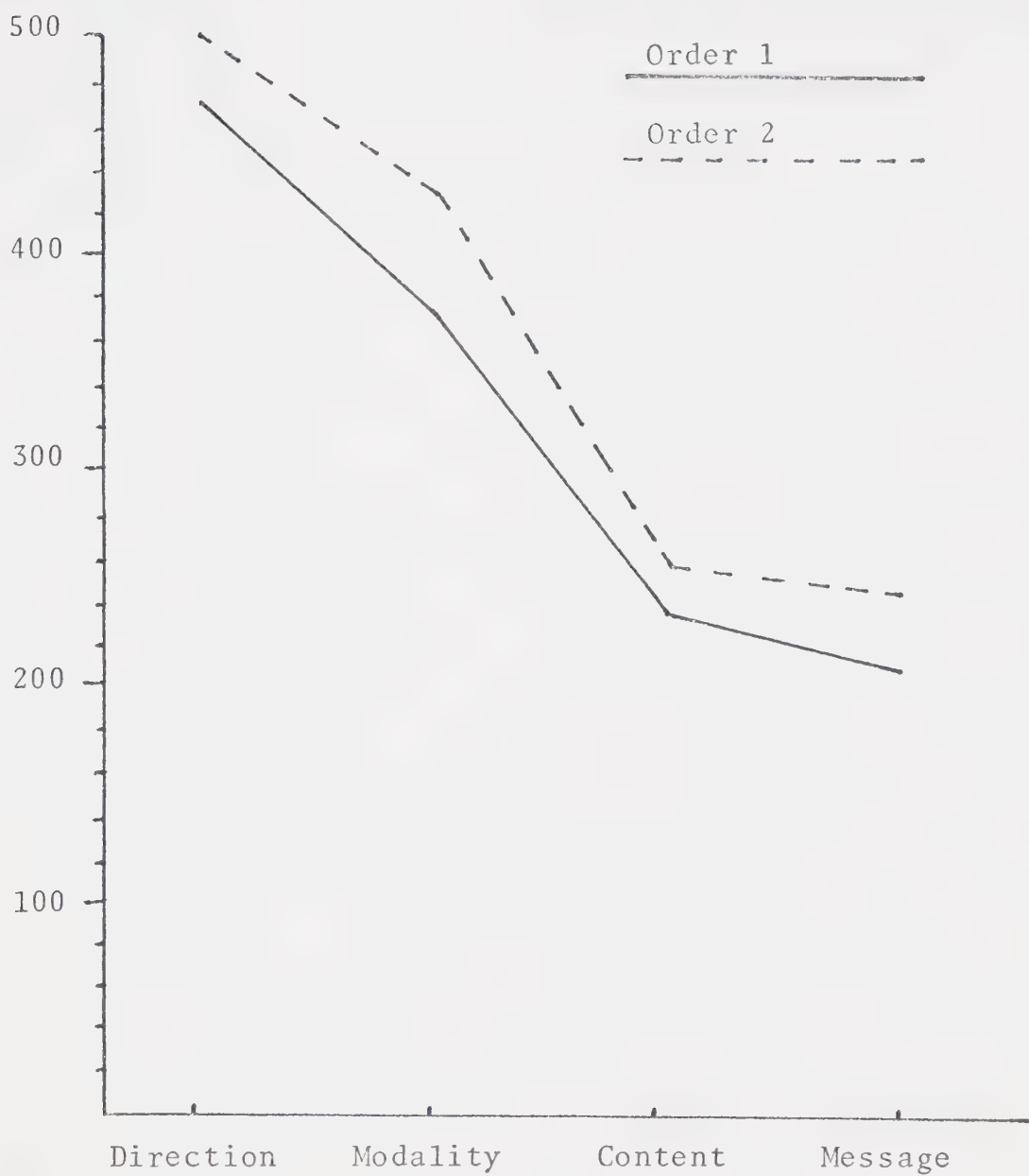


FIGURE 3

FREQUENCY COUNTS ON THE DIMENSIONS OF DIRECTION, MODALITY, CONTENT, AND MESSAGE FOR THE TWO ORDERS OF PRESENTATION OF THE SIMPLE SEQUENCES

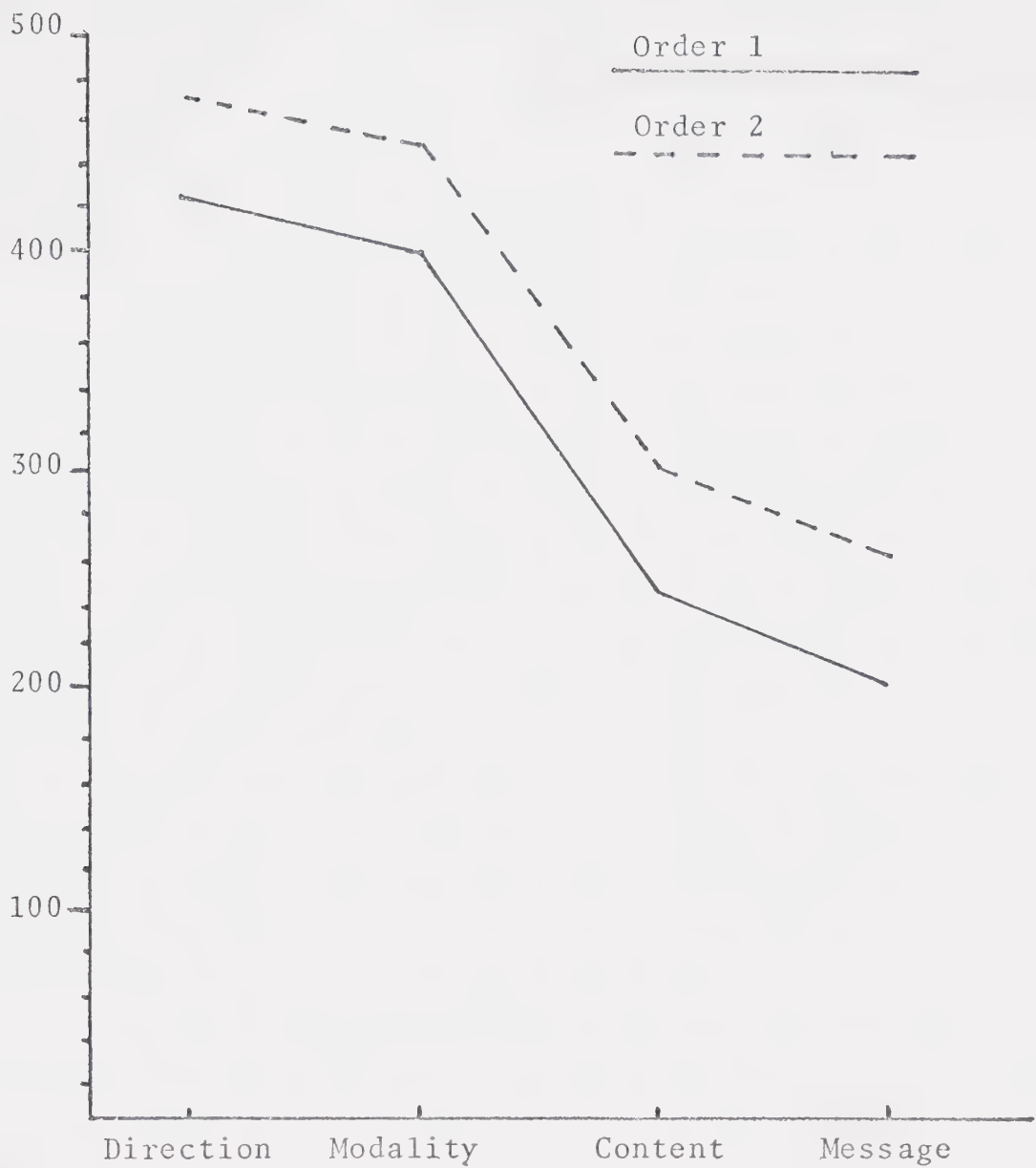


FIGURE 4

FREQUENCY COUNTS ON THE DIMENSIONS OF DIRECTION, MODALITY, CONTENT, AND MESSAGE FOR THE TWO ORDERS OF PRESENTATION OF THE COMPOUND SEQUENCES

information for compound pictures. It is obvious from Figure 4 that the same phenomenon has occurred: the two classes constituting Order 2 exhibit a better general achievement than those constituting Order 1.

For the simple pictures the frequency counts on the four dimensions for the different classes constituting an experimental group indicate that Class 2 (Cell 2, Figure 2, page 65) shows a generally superior performance to Class 1 (Cell 1). Class 4 (Cell 4) is superior to Class 3 (Cell 3) on the dimensions of direction and modality, while Class 3 is superior on content and message. In the analysis to determine the effect of order, Classes 1 and 3 were combined because they shared the same order of the sequences and Classes 2 and 4 were combined because they shared the other order. A plot of the frequency counts for these combinations is presented in Figure 3.

For the compound pictures similar cell frequency counts were made. Class 6 (Cell 6, Figure 2, page 65) had higher scores on all dimensions than Class 5 (Cell 5), and Class 8 (Cell 8) was generally superior to Class 7 (Cell 7). To determine the effect of order of presentation of the sequences, Classes 5 and 7 were combined because they shared the same order, and Classes 6 and 8 were joined because they shared the other order. To sum up: the overall superiority of the classes subjected to Order 2, for both simple and compound sequences, might account for the significant

influence of the order factor. The experimental design did not include control of the differences of ability between the groups. The sample classes were taken en bloc and randomly assigned to a treatment and to an order of presentation of the pictorial sequences. Thus, the superior scores achieved on Order 2 of the sequences may well have been a chance occurrence.

The Relationship Between the Kind of Picture and Interpretation

Direction was the only dimension on which the kind of picture was found to significantly effect success of interpretation. From Table XXXIX it can be seen that on this dimension the non-clarification treatment conditions yielded a 90 per cent correct response on the simple pictures and 85 per cent on the compound, and the clarification treatment conditions yielded a 94 per cent correct response on the simple pictures and 85 per cent on the compound. All the percentages are high, ranging from 85 per cent to 94 per cent, on direction, and the small but significant difference which exists between the simple and compound pictures is in favour of the simple pictures.

On the dimensions of modality, content, and message a different influence appears to be exerted by the kind of picture. The percentages of successful responses are much lower than on direction but generally slightly in favour of the compound pictures. The results suggest that with the

TABLE XXXIX

PERCENTAGE YIELD OF CORRECT RESPONSES BY PICTURES
AND TREATMENTS ON THE FOUR DIMENSIONS

Pictures	Direction		Modality		Content		Message	
	Non-Clar.	Clar.	Non-Clar.	Clar.	Non-Clar.	Clar.	Non-Clar.	Clar.
Simple	90	94	71	81	36	57	34	51
Compound	85	85	77	85	40	62	33	54

exception of the dimension of direction, compound pictures are not more difficult to interpret than simple pictures.

The Relationship Between the Kind of Treatment and Interpretation

On all the dimensions except direction the treatment conditions were found to have a highly statistically significant effect on the interpretation of the pictures. According to Table XXXIX a marked increase in the percentage yield of correct responses from the non-clarification to the clarification treatment conditions is apparent on the dimensions of modality, content, and message. The correct interpretation of both kinds of pictures appears to profit approximately equally as a result of the clarification treatment.

Direction. The high percentage yield of correct responses indicates that of the four, direction is the

easiest dimension to interpret. However, it would appear that the balloon, which is an ideographemic feature in the majority of compound pictures, inhibits the viewer from discerning the person to whom an utterance is directed. Although performance is quite high on this dimension, pupils are more apt to interpret a figure in a balloon as the person to whom the speech is directed rather than the one about whom the utterance is made. The figures and situations in the balloons are consistently drawn in black and white while the basic situation, the reference for what appears in the balloon, is always illustrated in colour. It would appear that this particular convention, although consistently sustained throughout the sequences, is not always recognized as such. It should be noted, too, that the clarification treatment did not overcome this difficulty. It is noteworthy that two of the three compound pictures which yielded the poorest results occur in the initial position in the sequence and do not show the person to whom the speech is directed. It is possible that context previous to the initial picture is necessary to establish the conversational situation because children of this age group, 11-12 years, may find it difficult to apply to the initial picture what they should learn from the ones that follow.

If the elements in each picture were counted, it could be shown that the total number of elements for a compound picture would generally be much larger than for a

simple picture. The compound picture is, thus, usually more dense than the simple picture. In addition, the compound picture must be interpreted on more than one level. The immediate conversational situation is established in the foreground with one or more characters, and the topic, comment and kind of utterance are established on another level: usually in a superimposed balloon. These factors of picture composition appear to make the task of correct interpretation easier for modality, content, and message. However, discerning the direction of the speech has been made more difficult. In the simple pictures the speakers are obviously marked by such devices as gestures, and indexes like raised eyebrows and open mouths, and the faces are generally large because the figures are close to the viewer. There are no parts of the composition except the pictorial situational background to distract the observer. In only one of the simple sequences do pictures occur which do not include the speaker of the accompanying speech but the initial picture of that sequence establishes who is speaking (Simple Sequence C, Appendix A). This initial picture was poorly understood with respect to direction, apparently because the speaker is facing away from the viewer and no other person is shown.

Modality. The simple picture which produced the second least successful interpretation on this dimension, and the compound picture which produced the least successful

interpretation were initial ones in their respective sequences. Whether the poor results were due to obscurity in the initial pictures themselves, or in the rest of the sequence that followed, or the lack of knowledge of the earlier context, or a combination of these factors is not known. The difference between the scores obtained from the two kinds of pictures was slight but in favour of the compound pictures. The ideographeme representing a question seemed to cause no extra difficulty except when it appeared in the final picture in a sequence. This suggests that a question is an unfortunate place at which to end a sequence because no answer follows. A comparison of the percentage yield of correct responses on this dimension with the per cent correct responses on direction suggests that as a general rule the correct interpretation of the kind of utterance is more difficult to make than the correct interpretation of direction.

Content. As was the case with modality, the content of the utterances was understood better with the compound pictures than with the simple pictures. From an examination of the percentage yields of correct responses in Table XXXIX, it can be seen that content is a much more difficult dimension to understand than direction or modality. Here, the information of the topic and comment which compose the content of a message cannot be conveyed by a gesture as direction can be or by a sign as modality can be. It must

rely on the total composition of the picture under examination, the immediate context of the smaller situation into which this picture fits, and the general context of the total situation of which the smaller situation is a part.

It was found that the treatment effect was highly significant in accounting for the variation in performance on content. It is illuminating to look at the actual percentage scores of correct responses for the different experimental conditions. The non-clarification treatment yielded 36 per cent correct responses on simple pictures and 40 per cent on compound pictures. The clarification treatment produced 57 per cent correct responses on simple pictures and 62 per cent on the compound pictures. The extremely low yield under the non-clarification treatment conditions suggests that by themselves the pictures are relatively inefficient as means of conveying meaning. The improved performance after the clarification treatment shows that something can be done to facilitate the conveying of meaning. It is quite obvious that the particular treatment used in this experiment was inadequate for classroom purposes. A teacher would likely strive for a clarification treatment that would result in a correct interpretation of a picture in 100 per cent of cases. Although there is generally an outstanding increase in performance between the two experimental conditions in this study, the percentage yields of correct responses under the clarification

treatment conditions are still generally too low for efficient classroom practice.

Message. A subject was credited with the correct message if he had the correct response for direction, modality, and content; thus, message is not a pure dimension but a combination of the three. It is, in effect, the index of the full meaning-conveying capacity of the picture. Under the non-clarification treatment conditions simple pictures yielded 34 per cent correct responses on the total message, and compound pictures yielded 33 per cent correct responses. Again, compound pictures hold no greater difficulty for interpretation than simple pictures. With the clarification treatment the simple pictures produced 51 per cent correct total messages and the compound pictures 54 per cent. These results, like those for the dimension of content, suggest that pictures must be clarified before they can begin to convey their intended message.

The Relationship Between the Observation of the Pictures for an Extended Period of Time and Interpretation

The time needed for the clarification treatment was not found to exert a significant influence on performance. An examination of Table XXII reveals that the performances resulting from the extended sequences were slightly superior to those from the non-extended sequences in the non-clarification treatment on all dimensions but there were no

statistically significant differences between the scores yielded by these two time-variation procedures. Any differences between the scores produced by the non-clarification and clarification treatments may thus be attributed to the intrinsic qualities of the treatment conditions themselves.

The Relationships Between the Dimensions

Examination of the Pearson product-moment correlations indicated that the best predictor of message for both kinds of pictures under either of the study conditions was content. This result was further substantiated by the stepwise regression analyses. A student who observes the simple pictures under either the non-clarification or clarification treatment conditions and correctly interprets the content will almost assuredly interpret the total message correctly. For the compound pictures this assurance is less marked but is nevertheless quite strong. The intercorrelations in Tables XXXI, XXXII, XXXIII, and XXXIV show that modality has some useful predictive power. The prediction is highly statistically significant for content and message for simple pictures, but for the compound pictures the value is much lower. It must be noted that direction displays little useful predictive function according to the same intercorrelation tables. The dimension of direction exhibits a statistically significant correlation of .42 with modality for compound pictures under

the non-clarification treatment conditions, but in the stepwise regression analyses (Tables XXXVI and XXXVII) it is not found to significantly account for any criterion variance in the message over and above that attributed to the other dimensions.

As stated in the previous chapter, the results of the stepwise regression analyses must be interpreted with caution because the criterion variable of total message is not independent of the three predictor variables: direction, modality, and content. A picture was credited with the correct message if correct interpretations were obtained on the three other dimensions. Table XXXVIII, on the compound clarification treatment conditions, reveals the presence of a suppressor variable. It was found that modality somewhat masks the effect of direction when the two act together as predictors but when the influence of modality is withdrawn, direction accounts for a greater portion of the variance in the message than it did before.

IV. OBSERVATIONS ABOUT CERTAIN ASPECTS OF THE INVESTIGATION

Two sequences viewed under the non-clarification treatment conditions were notable because their yield of correct responses on the dimension of content was extremely poor. However, only one class in each case showed a lack of ability to make correct interpretation. The total of correct

responses on content for Class 1 (Figure 2, page 65) for Simple Sequence C (Appendix A) was nine whereas its mean total score on the other sequences was twenty-two (Appendix J). This trend was absent in the performance of Class 2 although this class was exposed to the same pictures under the same conditions. Simple Sequence C lends itself to a variety of interpretations because in only one of the six frames is a person shown. There is no indication to whom this lady is speaking, her face cannot be seen, and she is making an ambiguous gesture.

The total correct score for Class 5 (Figure 2, page 65) on Compound Sequence X (Appendix A) was four whereas its mean total score on the other sequences was 29 (Appendix J). The score for Class 6 on the same sequence was twenty and was more in keeping with the mean of its scores on the other sequences. The sequence in question was poorly understood because the situation depicted in the five frames was complex. The subjects did not see the connection between the larger apartment, and the single room and its location. It might be suggested that the correct interpretation of Compound Sequence X depends on more complex factors because of the density of the elements in the pictures and the number of different levels at which the interpretation must be carried out.

Since the features of the illustrations comprising the two sequences just discussed were constant for both

classes observing them, the discrepancy between the correct scores for the two classes must be explained in some other way. It might be suggested that different classes exhibit different characteristics. Some classes, for example, may possess a spontaneity and enthusiasm; some may be reticent; some are more adventurous, while others may be predominantly uncertain and shy. The "group-personality" of a class may, in some way, account for an extraordinary response to a rich but ambiguous stimulus.

Further to the discussion of the two sequences which yielded poor results on content, it must be remarked that the ability to answer correctly the pictures in the problem sequences was not indicative of an overall interpreting ability. Some pupils correctly interpreted these more difficult pictures but showed no more skill with the remaining pictures than anyone else, while others misunderstood the difficult pictures but scored better than average on the remaining ones.

It was mentioned earlier in the chapter when the effect of the order of presentation of the sequences was being discussed that some classes appeared generally more proficient at picture interpretation than others. The investigator noticed in the course of administering the testing program that the general behaviour of a class seemed related to performance. The classes which settled down to attend to the task sincerely, and those in which the teacher

had developed a serious, businesslike atmosphere scored more successful responses than others. The groups which seemed to be less mature and more noisy appeared to do less well on the test. It would seem that "teacher effect" on a class's performance is very important but to suggest that this has influenced the findings of this study in any specific way is pure speculation.

IV. IMPLICATIONS FOR THE TEACHING OF FRENCH - FOR CLASSROOM PRACTICE AND FOR INSTRUCTIONAL PROGRAMS

Audio-visual teaching programs for foreign language instruction which rely totally on pictures for situational contextualization and advocate use of the target language only have a great number of problem areas inherent in them. Of the utmost importance is the capacity of each picture to convey accurately the program author's intended message. If there is any discrepancy between the received message of the observer and the intended message, the visual may defeat its own purpose. In such an audio-visual program as the one mentioned, an important primary procedure is the careful explanatory analysis of each picture in turn. This explanation, because of program prescriptions, is effected in the target language. If it is certain that an explanation can make the intended message obvious, the need for visuals which are capable of conveying the exact intended message is

not necessary. The assumption implied here is that any lack of familiarity a student may have with the foreign language, any lack of interpreting ability he may have, and any features which inhibit the understanding of visuals in any way can be overcome by the explanation. If, on the other hand, it is felt that understanding the picture in its context is the absolute pre-requisite for a program using visuals, the step of ensuring that the intended message has been received cannot be postponed, even to the explanatory step in the foreign language. This study has shown that the intended message, composed of the three qualities of direction, modality, and content, can be more completely conveyed by a clarification treatment.

Generally speaking, direction and modality offer no great problems of interpretation. The correct interpretation of direction may be hindered in a compound picture containing a balloon with a person in it. The correct interpretation of modality could depend upon the position in the sequence where a certain kind of utterance occurs. It was seen that the graphic sign of the question mark was a successful means of indicating a question except when it appeared in a picture at the end of a sequence. Because of the high correlation of content and total message, and the generally poor predictive value of direction and modality of the total message, it is essential that the teacher make certain that the content is understood. The content was composed of topic

and comment. It can be generally said that the simple and compound pictures as defined in this investigation are equal in their capacity to be correctly understood. The clarification treatment did not aid the interpretation of one kind of picture more than the other.

The most important finding arising out of this study must be reiterated. The kind of pictures presented in Voix et Images de France cannot be assumed to convey their intended message adequately enough for classroom purposes without some clarification procedure. As was stated in the introduction of the first chapter, the type of clarification procedure will correspond to the principal aim of the foreign language instructor. If he wishes to promote his students to the state of coordinate bilingualism, he will do his utmost to use the target language exclusively during class time. If he constantly makes reference to the mother tongue to convey the meaning of the foreign language structures, his students may never gain the facility of using the foreign language as an independent system of communication in its own right. The clarification procedure, however, would have to be more efficient than the one utilized in this investigation. Even after the clarification treatment had been given, the yield of correct responses on all of the dimensions, but especially on content, was inferior to what would be considered a sufficient foundation for further classroom work.

There are aspects of the investigation which should be kept in mind when the conclusions are examined: (1) each picture was taken from a small context and examined for its meaning-conveying qualities, (2) the short contexts, or sequences, were taken from larger sequences not seen by the subjects, (3) only three pictures from each sequence were selected for interpretation, and (4) student opinion about trouble spots in their program was not sought.

In order that visuals may be better utilized in classroom instruction, further research along the following lines is necessary:

(1) In audio-visual courses which include a dialogue accompanying a visual the individual merit of each component of the program should be known. The author has attempted to evaluate the information-conveying qualities of pictures by themselves. The sound component must be investigated as well.

(2) The pictures in this study were chosen according to whether they included only pictorial representations or these plus other signs or symbols. The essential components of a successful teaching picture and the way they are combined to best convey meaning have yet to be established.

(3) The effects of knowing the total context of a picture or of a smaller sequence of pictures should be investigated. One question to be answered is how much the

meaning of one picture is dependent upon its context.

(4) The relative position of a picture in a sequence may be indicative of its difficulty of interpretation. Therefore, the relative difficulty of the initial, medial, and final positions should be examined.

(5) The style of pictures presented in Voix et Images de France may not be representative of pictures found in other audio-visual courses. Samples of pictures taken from other programs should be examined.

(6) New insights into the problem areas of audio-visual programs could surely be gained by assessing student reaction to such courses at various levels and according to various criteria.

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A P P E N D I X A

TEST SEQUENCES

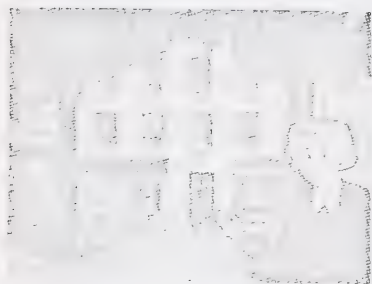
APPENDIX A

TEST SEQUENCES

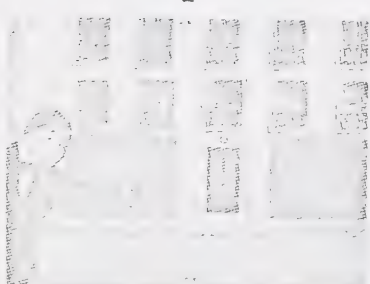
I. SIMPLE SEQUENCES

Sequence A

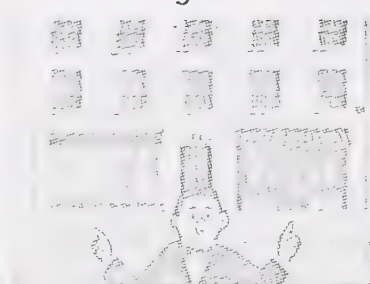
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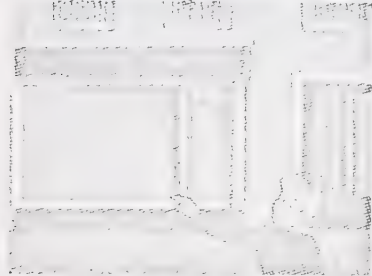
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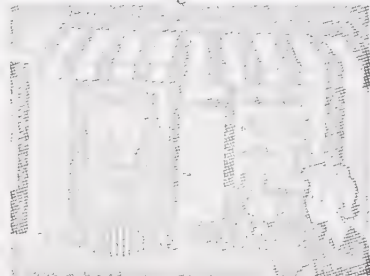
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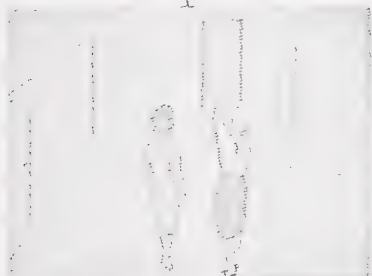
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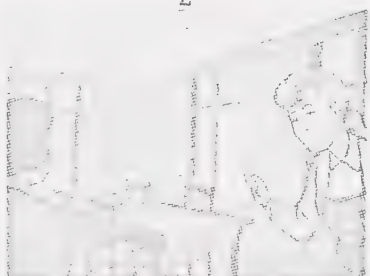
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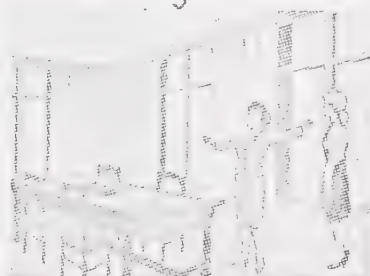
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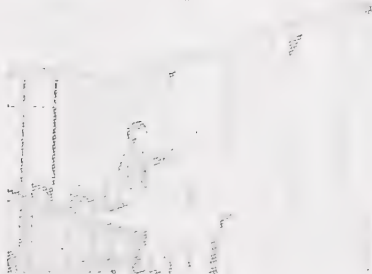
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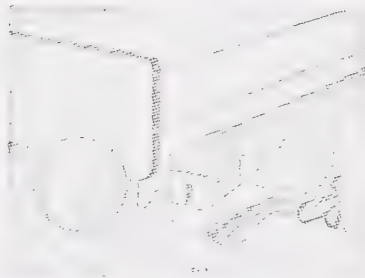


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Sequence D

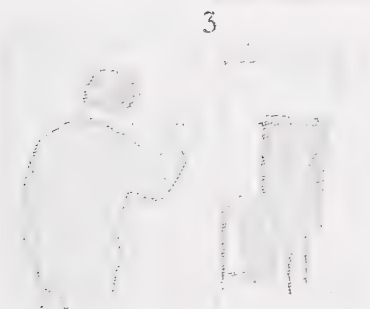
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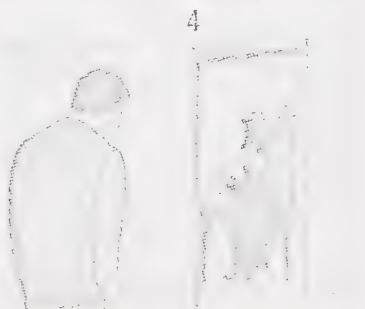
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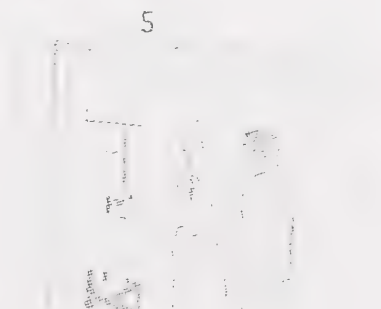
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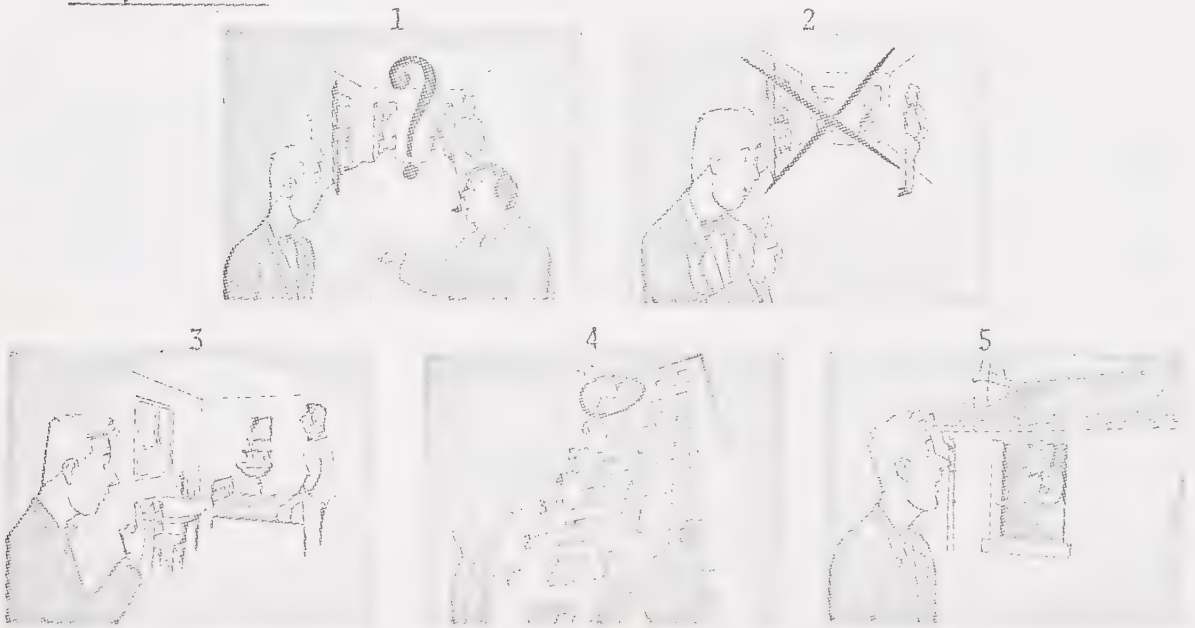


11. COMPOUND SEQUENCES

Sequence W



Sequence X



Sequence Y

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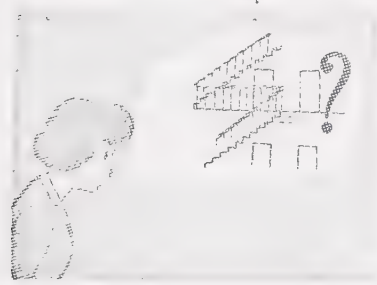
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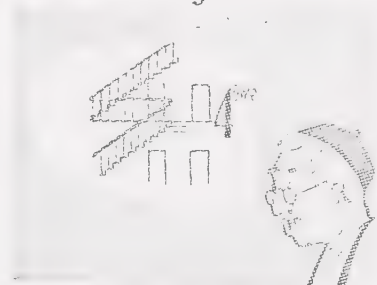
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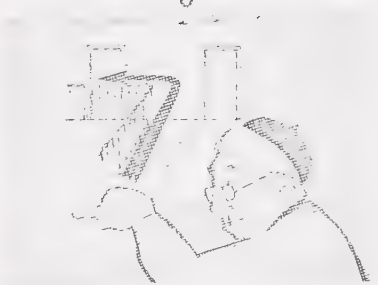
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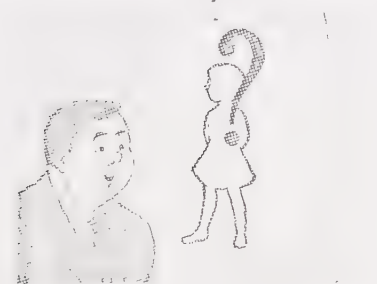
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A P P E N D I X B

THE INTENDED MESSAGE OF EACH PICTURE USED IN THE
PRACTICE AND TEST SEQUENCES

APPENDIX B

THE INTENDED MESSAGE OF EACH PICTURE USED IN THE
PRACTICE AND TEST SEQUENCES

I. PRACTICE SEQUENCES

Sequence 1

1. Bill: Is there a trolley nearby?
2. Tim: No, there's not.
3. Alice: But there's a bus.
4. Bill: Where's the bus-stop?
5. Tim: Right in front of the house.

Sequence 2

1. Bill: Hi, Mother.
2. Bill: Where are you?
3. Mother: I'm here in the kitchen.
4. Bill: What's for dinner?
5. Mother: Vegetable soup,
6. Mother: lamb chops,
7. Mother: and fruit cake.

II. TEST SEQUENCES - SIMPLE PICTURES

Sequence A

1. Marie: Voilà sa maison.
2. Lucien: En bas,
3. Lucien: il y a deux magasins
4. Marie: Oui, à gauche,
5. Marie: il y a une pharmacie.
6. Marie: C'est une épicerie.

Sequence B

1. Madame Thibaut: En face,
2. Madame Thibaut: c'est la salle à manger.
3. Jeannette: Elle est grande
4. Jeannette: et elle est très claire.
5. Madame Thibaut: Ici,
6. Madame Thibaut: c'est la cuisine.

Sequence C

1. Madame Thibaut: Il y a des jouets partout.
2. Madame Thibaut: sur le plancher,
3. Madame Thibaut: sur les lits,
4. Madame Thibaut: sur les meubles,
5. Madame Thibaut: sur les murs
6. Madame Thibaut: et même au plafond.

Sequence D

1. Madame Thibaut: Oui, il est dans son bureau.
2. Madame Thibaut: Michel, c'est Jacques.
3. Monsieur Thibaut: Ah! Bonjour, Jacques.
4. Monsieur Thibaut: Je viens tout de suite.
5. Madame Thibaut: Entrez dans la salle à manger.

III. TEST SEQUENCES - COMPOUND PICTURES

Sequence W

1. Présentatrice: Monsieur Thibaut est français.
2. Présentatrice: Vous habitez à Paris?
3. Monsieur Thibaut: Oui,
4. Monsieur Thibaut: j'habite place d'Italie,
5. Monsieur Thibaut: à Paris.
6. Présentatrice: Monsieur Thibaut est ingénieur.

Sequence X

1. Pierre: Vous avez un appartement?
2. Jacques: Non,
3. Jacques: j'ai seulement une chambre
4. Jacques: au septième étage
5. Jacques: sous le toit.

Sequence Y

1. Jeannette: Je suis une amie de Madame Thibaut.
2. Jeannette: Est-ce qu'elle est chez elle?
3. Le concierge: Oui, elle est là.
4. Jeannette: C'est à quel étage?
5. Le concierge: Au quatrième,
6. Le concierge: à gauche.

Sequence Z

1. Jacques: Est-ce que les enfants sont là?
2. Madame Thibaut: Oui, ils sont à la maison.
3. Monsieur Thibaut: Paul travaille dans sa chambre.
4. Jacques: Et Catherine?
5. Madame Thibaut: Elle est dans la salle de bain.
6. Jacques: Elle prend son bain?

A P P E N D I X C

ANALYSIS OF RESPONSES

APPENDIX C

ANALYSIS OF RESPONSES

I. SIMPLE SEQUENCES

Sequence A

Picture 1. "Voilà sa maison."

Direction: Marie is speaking to us or Lucien.
Modality: Assertion
Topic: Maison
Comment: Voilà

Picture 2. "Il y a deux magasins."

Direction: Lucien is speaking to us
Modality: Assertion
Topic: (En bas de la maison)
Comment: Deux magasins

Picture 3. "C'est une épicerie."

Direction: Marie is speaking to Lucien.
Modality: Assertion
Topic: (En bas, à droite de la maison)
Comment: Une épicerie

Sequence B:

Picture 1. "En face, . . ."

Direction: Madame Thibaut is speaking to
Jeannette.

Modality: Assertion

Topic: (L'appartement)

Comment: En face (de nous)

Picture 2. ". . . et elle est très claire."

Direction: Jeannette is speaking to Madame
Thibaut.

Modality: Assertion

Topic: (la salle à manger)

Comment: Très claire

Picture 3. ". . . c'est la cuisine."

Direction: Madame Thibaut is speaking to
Jeannette.

Modality: Assertion

Topic: (L'appartement)

Comment: La cuisine

Sequence C:

Picture 1. "Il y a des jouets partout.

Direction: Madame Thibaut is speaking to
Jeanette.
Modality: Assertion
Topic: Des jouets
Comment: Partout

Picture 2. ". . . sur les meubles, . . ."

Direction: Madame Thibaut is speaking to
Jeannette.
Modality: Assertion
Topic: (Des jouets)
Comment: Sur les meubles

Picture 3. ". . . et même au plafond."

Direction: Madame Thibaut is speaking to
Jeannette.
Modality: Assertion
Topic: (Des jouets)
Comment: Au plafond

Sequence D:

Picture 1. "Oui, il est dans son bureau."

Direction: Madame Thibaut is speaking to
Jacques.
Modality: Assertion
Topic: Il (Michel Thibaut)
Comment: Dans son bureau

Picture 2. "Je viens tout de suite."

Direction: Monsieur Thibaut is speaking to
Jacques.
Modality: Assertion
Topic: Je
Comment: Viens tout de suite.

Picture 3. "Entrez dans la salle à manger."

Direction: Madame Thibaut is speaking to
Jacques.
Modality: Command or request
Topic: Entrez
Comment: Dans la salle à manger

II. COMPOUND SEQUENCES

Sequence W

Picture 1. "Monsieur Thibaut est français."

Direction: The young lady is speaking to us.
Modality: Assertion
Topic: Monsieur Thibaut
Comment: Français

Picture 2. ". . . j'habite place d'Italie, . . ."

Direction: Monsieur Thibaut is speaking to
the young lady.
Modality: Assertion
Topic: Je
Comment: Habite place d'Italie

Picture 3. "Monsieur Thibaut est ingénieur."

Direction: The young lady is speaking to us.
Modality: Assertion
Topic: Monsieur Thibaut
Comment: Ingénieur

Sequence X

Picture 1. "Vous avez un appartement?"

<u>Direction:</u>	Pierre is speaking to Jacques.
<u>Modality:</u>	Interrogation
<u>Topic:</u>	Appartement
<u>Comment:</u>	Vous avez

Picture 2. ". . . j'ai seulement une chambre . . ."

<u>Direction:</u>	Jacques is speaking to Pierre.
<u>Modality:</u>	Assertion
<u>Topic:</u>	Une chambre
<u>Comment:</u>	J'ai seulement

Picture 3. ". . . sous le toit."

<u>Direction:</u>	Jacques is speaking to Pierre.
<u>Modality:</u>	Assertion
<u>Topic:</u>	(Une chambre)
<u>Comment:</u>	Sous le toit

Sequence Y:

Picture 1. "Je suis une amie de Madame Thibaut."

Direction: Jeannette is speaking to the old man.
Modality: Assertion
Topic: Madame Thibaut
Comment: Je suis une amie de

Picture 2. "Oui, elle est là."

Direction: The old man is speaking to Jeannette.
Modality: Assertion
Topic: Elle (Madame Thibaut)
Comment: Est là

Picture 3. ". . . à gauche"

Direction: The old man is speaking to Jeannette.
Modality: Assertion
Topic: Elle (Madame Thibaut)
Comment: A gauche

Sequence Z:

Picture 1. "Est-ce que les enfants sont là?"

Direction: Jacques is speaking to Madame
Thibaut.
Modality: Interrogation
Topic: Les enfants
Comment: Sont là

Picture 2. "Paul travaille dans sa chambre."

Direction: Monsieur Thibaut is speaking to
Jacques.
Modality: Assertion
Topic: Paul
Comment: Travaille dans sa chambre

Picture 3. "Elle prend son bain?"

Direction: Jacques is speaking to Madame
Thibaut.
Modality: Interrogation
Topic: Elle (Catherine)
Comment: Prend son bain

A P P E N D I X D

INTRODUCTION AND PRELIMINARY EXPLANATIONS FOR ALL GROUPS

APPENDIX D

INTRODUCTION AND PRELIMINARY EXPLANATIONS
FOR ALL GROUPS

Good morning, my name is Mr. Roger Clements, and I'm here today to carry out a little research on the kind of pictures that you see every day in your French lessons. What I want to find out is how good pictures are at doing what they are supposed to do. Now, you know as well as I do, what they are supposed to do: they should tell a story all by themselves even if we don't hear any commentary with them. So, you see, this is going to be a test for the pictures. But your help is needed so that they can be tested.

You will see sequences of five or six pictures but you won't hear the dialogue that goes with them. The first two sequences, by the way, have been taken from a language instruction program which teaches people from foreign countries to speak English. Then you will be shown some of the pictures one at a time and you will write down what you think the appropriate interpretation of each picture is.

From this point you will get all your instructions and information from this tape recorder. My voice is on there, so I'm sure you won't have any trouble in understanding.

A P P E N D I X E

EXPLANATIONS FOR THE PRACTICE SEQUENCES FOR
ALL TREATMENT CONDITIONS

APPENDIX E

EXPLANATIONS FOR THE PRACTICE SEQUENCES FOR
ALL TREATMENT CONDITIONS

In the sequences of pictures which follow you will be interpreting the first picture, a picture which occurs in the middle, and the final picture. Throughout the tape you will hear a bell like this (). This is not a signal for you: it's for me so that I know when to change pictures. Your signal will be a buzzer like this (). When you hear this signal (), you will know that this is the picture for you to interpret. Ten seconds after the buzzer you will hear the word "Write", and you will know to begin writing. Twenty seconds later you will hear the word "Stop", and know that you should stop writing and wait for the next picture.

Look at your answer sheet now. The next two sequences that you see on the screen are labelled A and B on your answer sheet. Notice that A has three parts: 1, 2, and 3, and so has B. You will not have to write your interpretations of the three pictures of Sequence A as they have already been done. The way that this sequence is presented to you is the same as for those that follow. Let's look at A. (Sequence A is shown under the same conditions as the test sequences which are to follow. At this point there are two alternatives: (a) is the information given to the groups

which undergo the non-clarification treatment conditions, and (b) is the information given to the groups which undergo the clarification treatment conditions.)

(a) In this example you saw the sequence twice, heard the buzzer, and saw the picture to be interpreted.

(b) In this example you saw the sequence once, saw it again with a taped voice accompaniment, and then you saw it once more. (From this point on the explanation is once again the same for all groups.) Ten seconds later you heard the word "Write", and would have begun writing. You could have written, "Is there a trolley nearby?" as a possible interpretation. Twenty seconds later you heard the word "Stop". Notice that this answer is next to number 1 of A. Then you heard the buzzer again and saw the next picture to be interpreted. Ten seconds later you heard "Write", and could have written "But there's a bus", as a possible interpretation. Twenty seconds later you heard "Stop". Notice that this answer is next to number 2 of A. You then heard the buzzer and saw the next picture to be interpreted. Ten seconds later you heard "Write", and could have written "Right in front of the house", as a possible answer. Twenty seconds later you heard "Stop". Notice that this answer is next to number 3 of A.

Let's do Example B ourselves in the same way. (B is presented.) A possible interpretation for B1 is, "Where are you?" For B2 you could have written, "What's for dinner?"

For B3 one interpretation could be, ". . . and fruit cake."

Are there any questions? Now let's begin.

A P P E N D I X F

PROCEDURE FOR THE PRESENTATION OF THE SEQUENCES
UNDER THE NON-CLARIFICATION AND CLARIFICATION
TREATMENT CONDITIONS

APPENDIX F

PROCEDURE FOR THE PRESENTATION OF THE SEQUENCES
UNDER THE NON-CLARIFICATION AND CLARIFICATION
TREATMENT CONDITIONS

I. PROCEDURE FOR THE NON-CLARIFICATION TREATMENT
CONDITIONS WITH THE NON-EXTENDED TIME VARIATION

1. The sequence is shown through once with a period of seven seconds between frames. A bell is sounded to indicate the time to change frames.
2. The first step is repeated.
3. The first picture for interpretation is presented with the instruction, "Picture for interpretation number 1" (buzzer).
4. After ten seconds the instruction "Write" is given.
5. After twenty seconds the instruction "Stop" is given.
6. The second picture for interpretation is presented with the instruction, "Picture for interpretation number 2" (buzzer).
7. Same as step 4.
8. Same as step 5.
9. The third picture for interpretation is presented with the instruction, "Picture for interpretation number 3" (buzzer).
10. Same as step 4.
11. Same as step 5.

II. PROCEDURE FOR THE NON-CLARIFICATION TREATMENT

CONDITIONS WITH THE EXTENDED TIME VARIATION

The sole difference between the procedure under this variation and the procedure of the preceding variation, the non-extended time conditions, is in the length of time for which each frame is presented for observation. The following table is a summary of the calculation of the extended period of time necessary for each sequence calculated in Table I, page 69. The presentation of the pictures for an extended observation time is made between Steps 1 and 2.

SEQUENCES AND NECESSARY EXTENDED PERIOD OF TIME FOR THE OBSERVATION OF EACH SEPARATE PICTURE

Sequence	Extended Period of Time per Picture
Simple	
A	26 sec
B	23
C	11
D	22
Compound	
W	30 sec
X	24
Y	24
Z	27

III. PROCEDURE FOR THE CLARIFICATION TREATMENT

CONDITIONS

The difference between the procedure for these treatment conditions and the procedure for the non-clarification treatment conditions with the non-extended time variation is an added step. The clarification treatment for the sequence being presented is given between steps 1 and 2.

A P P E N D I X G

CLARIFICATION TREATMENT CONDITIONS

APPENDIX G

CLARIFICATION TREATMENT CONDITIONS

A. PRACTICE SEQUENCES

Practice Sequence A

(bell) Picture 1. Notice who is speaking. You can tell by the mouths and the direction of the eyes (show). See how the people are dressed (show). One of them is wearing a top-coat and must be ready to leave the house (show). Is the speaker making a statement, giving a command, or asking a question (show question mark)? What he is talking about is shown here (show trolley), and obviously he is asking about a means of transportation. This sort of trolley car is not seen in Canadian cities today (show), but it is seen in some parts of America. Now you will be able to work out what is being said (bell).

Picture 2. You can see whether this man is speaking, by his mouth and gesture (show). Notice these lines to show movement of the hand from side to side (show). This time the trolley has a cross through it (show). Does the cross and hand movement mean that he is making a negative statement (bell)?

Picture 3. You can tell by the mouth and gesture if the lady is speaking (show). What she is talking about is here (show bus in balloon) (bell).

Picture 4. Look at the mouth, gestures, and question marks (show). Is the man making a statement, giving a command, or asking a question? He is, of course, referring to this thing (show bus-stop). If you lived in certain parts of America, you would recognize this thing as a bus-stop (bell).

Picture 5. See who is speaking (show mouth and gesture), and what he is talking about (show gesture extended to bus-stop). Notice the relationship of the bus-stop and the house (show) (bell).

Practice Sequence B

(bell) Picture 1. Is this man speaking (show mouth)? You cannot really tell from this picture whether he is coming in or going out, but if we look at the following pictures, we can see that he is in the house and has taken his topcoat off (bell) (show 2) (bell) (show 4) (bell) (show 1). Now we know he has just entered. What do you think he would say having just come in (bell)?

Picture 2. Here, he is speaking again (show mouth). Is he making a statement, giving an order, or asking a question (show question marks)? You can see who he is talking about (show figure in balloon). There are a number of different places shown here marked by a question mark (show). Do you think he knows where this person is? Notice the figure of the woman (show). Is it a young lady's figure or an older lady's? You must decide who this person is (show).

Perhaps it's his wife . . . his neighbour . . . his sister . . . his mother . . . his aunt . . . (bell)?

Picture 3. Notice that this woman (show) is this woman (bell) (show 2) (show figure in balloon) (bell) (show 3). Is she speaking (show mouth)? You can tell by the surroundings where she is (show refrigerator, stove, cupboards, and spoon in hand) (bell).

Picture 4. The man has come in from work, taken his coat off, and entered the room where the cooking is being done (show pot and rising steam). Is he speaking (show mouth and gesture)? Is he making a statement, giving a command, or asking a question (show question marks)? You can see what he is talking about (show cup and saucer, plate, bowl, and serving dish). I suppose what he is saying is the same thing you say when you come home just before supper (bell).

Picture 5. I don't suppose you have a large serving bowl for soup like this (show). You can tell what kind of soup it is (show vegetables in the balloon). Notice the lady's mouth and gesture (show). You should be able to decide what she is saying (bell).

Picture 6. Here, she is continuing to speak (show mouth and gesture). This is a plate of meat (show), and this is a well-known animal (show). Can you tell me why they are both shown (bell)?

Picture 7. And she goes on answering (show mouth and gesture). You can see her pointing to a cake (show).

Can you tell what kind of cake it is (show fruit in balloon) (bell).

B. TEST SEQUENCES - SIMPLE PICTURES

Sequence A

(bell) Picture 1. Notice who is speaking (show mouth), and what she is talking about (show apartment building), and who she is talking to (show the direction of the eyes) (bell).

Picture 2. Notice who is speaking (show mouth). He is talking about the same thing (show apartment block), but a particular part of it (show the ground floor) (bell).

Picture 3. He continues to speak (show mouth). You can see what he is talking about (show two fingers and two stores). It is a common thing in France to see small stores on the lower level of an apartment building (bell).

Picture 4. The girl is continuing to speak (show mouth). Notice that the door here (show) and the window she is pointing to at her left (show) are the same as there (bell) (show 3) (bell).

Picture 5. You can see that this is the same picture as the last except for the details in the window. Notice the medical sign above (show) and such things as adhesive tape, bandages, ointment, toothpaste, and soap inside (show). You know now what kind of store it is (bell).

Picture 6. Notice that this store is this one (bell) (show 3) (bell) (show 6). The lady goes on talking

(show mouth). You can see the details in this window telling you what kind of store it is: fruit, vegetables, cans of food, bottles of pop, sauce, jam and so on, and there must be many other kinds of food for sale (bell).

Sequence B

(bell) Picture 1. In this picture and this one (bell) (show 5) the ladies are in the same place in the apartment (bell) (show 2). Here is a different room which is different from this one (bell) (show 6) (bell) (show 1). Why is the lady pointing? Do you think she is also speaking? Is she pointing to the side, behind, or in front (bell)?

Picture 2. Can you tell what room this is? Look at the furniture: the chairs, the table, and what is on the table (show). You can tell who is speaking by the gesture and face (show) (bell).

Picture 3. This is a gesture we always use to express size (show). The lady is talking about the size of something. Notice the direction of her eyes (show) (bell).

Picture 4. She continues speaking about the same subject (show). There is something shown in this picture which is not shown in the others (show light beams) (bell) (show 3) (bell) (show 2) (bell).

Picture 5. Here the ladies have left that room and are back where they were at the beginning. You can see the door they came out of (bell).

Picture 6. The furniture here will tell you what room this is (show stove, sink, cupboards, and table).

Obviously, this lady is still showing the other one around the apartment (bell).

Sequence C

(bell) Picture 1. Whose bedroom is this? The lady's gestures will tell you what objects she is talking about (show gestures and extend to toys) (bell).

Picture 2. Where are some of these things (show) (bell)?

Picture 3. Where are others (show) (bell)?

Picture 4. And others (show drawers, chairs, stool, and table) (bell)?

Picture 5. And others (show) (bell)?

Picture 6. And there are some even here (show (bell)).

Sequence D

(bell) Picture 1. You can see who is speaking by the open mouth (show), and who she is talking to by the direction of her eyes (show), and who she is talking about by her gestures (show) (bell).

Picture 2. She is now talking to the other person (show mouth and direction of eyes). Notice who she is talking about (show gesture and Jacques) (bell).

Picture 3. These men are friends, aren't they? Their way of greeting each other is quite informal (show). You can see which one is speaking at this moment (show) (bell).

Picture 4. Here, this man is telling the other one something. Look at his mouth and gesture (show). Compare his position (bell) (show 1). Here, he is writing (bell) (show 2). Here, he is smiling (bell) (show 3). Here, he is speaking and moving back from the table (bell) (show 4). Here, his position has changed; he looks as if he is beginning to rise. Also, look at his hand (show) (bell).

Picture 5. Because the other man is not yet in the picture, perhaps you can guess what he said in the last picture. What room is this? Notice the furniture (show table, chair, glass, and plate). Why do you think the lady is pointing to the room and speaking to the visitor (show) (bell)?

C. TEST SEQUENCES - COMPOUND PICTURES

Sequence W

(bell) Picture 1. Somebody is saying something about this man. Whatever is being said is about this shape (show outline map of country). Did you recognize the shape as the map of France (bell)?

Picture 2. Notice who is speaking (show finger gesture, mouth and eyes of the young lady). Is she making a statement, giving an order, or asking a question (show question mark)? All of these things: the Eiffel Tower (show), the River Seine (show), and the close buildings (show) represent a particular city. Now can you decide what the

question is about (bell).

Picture 3. These are signs of movement to show a nodding head (show). Is he speaking (bell)?

Picture 4. Look at the open mouth and gesture (show). Do you think he is speaking about himself? What he is saying is here (show). If you had to draw your house, the street it is on, and the area around it, would you make a picture like that (show) (bell)?

Picture 5. You can see that the same person is still speaking (show mouth). This is a representation of Paris, the same city you just saw (bell) (show 2) (bell) (show 5). It's the same tower, the same river, and city limits (show). This time the man's address as seen in this picture (bell) (show 4) (bell) (show 5) has been placed in this city (show) (bell).

Picture 6. Notice that this man (show Michel Thibaut in the picture) is the same person as this man (show Michel Thibaut in the balloon). He is doing a particular kind of work. See his coat (show), his desk (show), and the equipment he uses (show drawing board, lights, and rulers). Now you know what job he does. You can see who is speaking (show mouth) and who she is talking about (show gesture). If you follow the direction of her eyes, you can tell who she is talking to (show). Do you know what she is saying about him? (bell).

Sequence X

(bell) Picture 1. Notice who is speaking and who he is speaking to (show mouths of both people, and gesture). Is he making a statement, giving a command, or asking a question (show question mark)? This man (show Jacques in the picture) is this man (show Jacques in the balloon). The French apartment that you see here (show) is not like the apartments you are likely to see in Edmonton (show the three doors) (bell).

Picture 2. This is still the same person (show both Jacques). Notice the cross (show) and the finger (show). Do they indicate a positive or a negative reply (bell)?

Picture 3. Once again we have the same person (show Jacques in the picture and in the balloon) and he is continuing to answer (show mouth). This time there are no marks of movement around the finger. We often hold our finger like this when we are counting (show). This single room must serve all of the man's purposes (show bed, table and chair, and wash-basin) (bell).

Picture 4. The same man continues to talk. See his mouth and gesture (show). You can see that the floors are numbered (show). If you follow his finger, you will see that the seventh floor is circled (show) (bell).

Picture 5. The same continues (show), and is still here (show him in the balloon). Notice where the window of his room is in relation to the roof (show) (bell).

Sequence Y

(bell) Picture 1. This unusual-looking man is a kind of janitor (show). He is called a concierge. He takes care of the apartment block in France. He sweeps the stairway, takes the mail around, and lets in any visitors because the front door is always kept locked. See who is speaking (show mouths of Jeannette and concierge) and who is being spoken to (show direction of the eyes). Notice that these two are the same person, (show Jeannette in the picture and Jeannette in the balloon). You can tell that these two ladies are friends (show interlocked arms). Obviously, she is saying something about herself (show self-index) and this lady (show Françoise) (bell).

Picture 2. Here is a cutaway picture of an apartment (show). You can see that this is the same lady (show Françoise) (bell) (show 1) as this (show Françoise) (bell) (show 2). This lady is still speaking (show mouth and gesture). Is she making a statement, giving a command, or asking a question (show question mark)? What do you think she wants to know (bell)?

Picture 3. Here is the answer (show mouth and gesture) about the same lady (show Françoise) (bell).

Picture 4. Is the speaker making a statement, giving a command, or asking a question (show mouth and question mark)? Notice the staircase (show). Stairways in our apartment blocks are usually hidden but this scene takes place in France (bell).

Picture 5. Once more the concierge answers the question (show mouth). Why is that "4" there (show) (bell)?

Picture 6. He continues (show mouth and gesture). You can see the direction he is indicating (show). Is it to the right or left (bell)?

Sequence Z

(bell) Picture 1. You can see who is speaking (show mouth and gesture), and what he is talking about (show finger and outlines of Paul and Catherine). Is he making a statement, giving a command, or asking a question (show question mark)? Notice that these are the same children throughout the sequence (show). This is the same boy (show) (bell) (show 2) (show boy) (bell) (show 3) (show boy) (bell) (show 1). And this is the same girl (show) (bell) (show 2) (show girl) (bell) (show 4) (show girl) (bell) (show 5) (show girl) (bell) (show 6) (show girl) (bell).

Picture 2. Here is the answer (show Françoise's mouth and gesture) to the same subject (show finger and outlines of Paul and Catherine) (bell).

Picture 3. Notice who is speaking (show mouth), and where the boy is (show Paul's bedroom in the balloon). This must be more of the answer to the question (bell).

Picture 4. See who is speaking again (show mouth). Look at who he is talking about (show outline of Catherine). Is he asking a question, making a statement, or giving an

order (show question mark) (bell)?

Picture 5. You can see who is speaking (show Françoise's mouth) and who she is talking about (show Catherine). Notice which room she is in (show both and shower) (bell).

Picture 6. See who is speaking (show mouth), and who he is talking about (show Catherine). Is he making a statement, giving a command, or asking a question (show question mark)? You can easily see what she is doing (show bath, water, taps, and actions of Catherine). Can you now work out the question (bell)?

A P P E N D I X H

PICTURE INTERPRETATION - ANSWER SHEET

APPENDIX H

PICTURE INTERPRETATION - ANSWER SHEET

Name:

School:

Sex:

Age:

Group:

PRACTICE SEQUENCES

- A. 1. Is there a trolley nearby?
2. But there's a bus.
3. Right in front of the house.

- B. 1. _____
2. _____
3. _____

SEQUENCES

- I. 1. _____
2. _____
3. _____

- II. 1. _____
2. _____
3. _____

- III. 1. _____
2. _____
3. _____

- IV. 1. _____
2. _____
3. _____

A P P E N D I X I

TIMETABLE OF TEST ADMINISTRATION FOR SCHOOLS SHOWING THE
EXPERIMENTAL PHASE TO WHICH EACH CLASS WAS SUBJECTED

APPENDIX I

TIMETABLE OF TEST ADMINISTRATION FOR SCHOOLS SHOWING THE
EXPERIMENTAL PHASE TO WHICH EACH CLASS WAS SUBJECTED

SCHOOL	EXPERIMENTAL PHASE	TIME - DATE
<u>Pilot Study</u>		
I. High Park	All phases	(a) 9:00 - 11:00 a.m. April 7, 1970 (b) 9:00 - 11:00 a.m. April 8, 1970
II. Lansdowne	Clarification - Simple	11:00 - 12:00 noon April 9, 1970
<u>Study Proper</u>		
Laurier Heights	Non-clarification - Compound (1)	1:30 - 2:30 p.m. April 14, 1970
Greenfield	Non-clarification - Simple (2)	9:15 - 10:15 a.m. April 15, 1970
Fulton Place	Non-clarification - Simple (1)	1:30 - 2:30 p.m. April 15, 1970
D.S. MacKenzie	Clarification - Compound (2)	8:45 - 9:45 a.m. April 16, 1970
Parkview	Clarification - Simple (2)	3:00 - 4:00 p.m. April 16, 1970
McKernan	Clarification - Compound (1)	9:00 - 10:00 a.m. April 21, 1970
Crestwood	Clarification - Simple (1)	3:00 - 4:00 p.m. April 21, 1970
Rio Terrace	Non-clarification - Compound (2)	2:30 - 3:30 p.m. April 22, 1970

A P P E N D I X J

FREQUENCY COUNTS FOR ALL CLASSES OF STUDENTS FOR
ALL PICTURES ON ALL DIMENSIONS

APPENDIX J

FREQUENCY COUNTS FOR ALL CLASSES OF STUDENTS FOR ALL PICTURES ON ALL DIMENSIONS

Treatment and Kind of Picture	Treatment and Kind of Picture						
	A*	B	C	D	E	F	G
Non- Clarification Simple	1	A	1	18	11	02	01
	1	A	2	15	11	06	05
	1	A	3	18	18	09	08
	1	B	1	18	16	12	10
	1	B	2	18	16	08	07
	1	B	3	18	19	14	13
	1	C	1	19	13	01	01
	1	C	2	18	17	02	02
	1	C	3	19	17	06	06
	1	D	1	21	15	10	10
	1	D	2	21	03	01	01
	1	D	3	21	13	03	02
	2	A	1	20	19	04	04
	2	A	2	19	19	11	10
	2	A	3	20	21	13	13
	2	B	1	22	21	11	11
	2	B	2	22	20	17	17
	2	B	3	22	21	21	21
	2	C	1	20	12	03	03
	2	C	2	20	15	04	04
Clarification Simple	2	C	3	20	17	13	12
	2	D	1	22	20	13	13
	2	D	2	22	11	03	03
	2	D	3	22	11	03	03
	3	A	1	22	16	16	13
	3	A	2	21	16	19	14
	3	A	3	22	20	18	18
	3	B	1	21	19	13	13
	3	B	2	21	20	20	17
	3	B	3	22	20	22	20
	3	C	1	16	15	04	03
	3	C	2	17	20	15	13
	3	C	3	17	19	14	12
	3	D	1	22	17	12	12
	3	D	2	22	08	01	01
	3	D	3	22	17	07	04
	4	A	1	18	17	06	05
	4	A	2	22	17	10	09
	4	A	3	21	21	16	16
	4	B	1	19	18	12	11
	4	B	2	20	22	14	12
	4	B	3	20	20	22	18
	4	C	1	20	15	04	04
	4	C	2	22	21	12	12
	4	C	3	22	21	16	16
	4	D	1	22	20	14	14
	4	D	2	22	10	07	07
	4	D	3	22	18	06	06

APPENDIX J (CONTD.)

Treatment and Kind of Picture								Clarification Compound							
A	B	C	D	E	F	G		A	B	C	D	E	F	G	
5	W	1	11	16	13	08	Non-Clarification Compound	7	W	1	12	19	16	11	
5	W	2	20	19	09	08		7	W	2	20	19	12	12	
5	W	3	13	13	11	07		7	W	3	15	19	18	14	
5	X	1	22	19	01	01		7	X	1	19	19	06	06	
5	X	2	20	17	01	02		7	X	2	20	19	11	10	
5	X	3	20	17	02	03		7	X	3	19	20	12	12	
5	Y	1	20	09	04	03		7	Y	1	18	11	14	08	
5	Y	2	21	19	08	07		7	Y	2	19	15	08	08	
5	Y	3	22	19	14	13		7	Y	3	19	19	17	17	
5	Z	1	12	15	09	09		7	Z	1	16	19	14	13	
5	Z	2	15	12	03	03		7	Z	2	18	17	08	07	
5	Z	3	16	16	16	07		7	Z	3	16	16	15	11	
6	W	1	13	14	11	08	Clarification Compound	8	W	1	15	20	18	14	
6	W	2	20	20	05	04		8	W	2	20	21	14	14	
6	W	3	15	16	12	09		8	W	3	16	22	18	13	
6	X	1	22	21	10	10		8	X	1	22	21	07	06	
6	X	2	21	19	05	05		8	X	2	21	21	12	12	
6	X	3	21	20	05	05		8	X	3	22	22	13	13	
6	Y	1	21	10	07	04		8	Y	1	22	15	13	11	
6	Y	2	22	17	10	09		8	Y	2	22	19	16	16	
6	Y	3	22	22	16	16		8	Y	3	21	21	18	18	
6	Z	1	17	21	17	17		8	Z	1	19	21	19	17	
6	Z	2	20	18	08	08		8	Z	2	17	18	11	10	
6	Z	3	21	17	14	10		8	Z	3	19	16	19	10	

* A -	Class	D -	Direction
B -	Sequence	E -	Modality
C -	Picture	F -	Content
		G -	Message

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